

IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF MARYLAND, SOUTHERN DIVISION

STAR SCIENTIFIC, INC.,

Plaintiff,

v.

R.J. REYNOLDS TOBACCO COMPANY,

Defendant.

Case No. AW 01-CV-1504

RECEIVED  
JUN 20 2003  
TC 1700

**PLAINTIFF'S RESPONSE TO DEFENDANT'S  
SECOND SET OF INTERROGATORIES**

Under Federal Rule of Civil Procedure 33, Plaintiff Star Scientific, Inc. ("Star Scientific") responds to Defendant R.J. Reynolds Tobacco Company's ("RJR") Second Set of Interrogatories [Nos. 16-27].

**GENERAL OBJECTIONS**

1. Star Scientific objects to the interrogatories to the extent that they request information that is covered by the attorney-client and/or work product privilege or any other applicable privilege.
2. Star Scientific objects to each interrogatory that purports to impose upon Star Scientific any obligation greater than or different from those required under the Federal Rules of Civil Procedure and the Local Rules and Orders of the Court.

Interrogatory No. 17:

Identify all studies (published or unpublished) of which Star is aware concerning the reasons for the formation of TSNAs in flue-cured tobacco, including, but not limited, to the "scientifically untenable studies" referenced in Star's Supplemental Response to Reynolds' Interrogatory No. 8.

Response

In addition to the General Objections, Star Scientific objects to this interrogatory as overly broad and unduly burdensome. RJR is intimately familiar with studies of nitrosamine formation and has produced extensive studies as part of its own discovery responses. Subject to these objections, Star Scientific states that pursuant to Fed .R. Civ. P.33(d), Star Scientific has produced all studies in its possession concerning the reasons for the formation of TSNAs in flue-cured tobacco. Although these studies can be found throughout Star Scientific's document production, many can be found at STAR 009368-009375, STAR 009725-009932, STAR 010218-010229, and STAR 010554-010565.


RJR has also produced studies (published and unpublished) concerning the reasons for the formation of TSNAs in flue-cured tobacco. Star Scientific believes that it is not necessary for Star Scientific to identify these studies, since they are part of RJR's own production. With the exception of the studies Star Scientific has already produced and those RJR produced, Star Scientific is not aware of any other relevant studies.

The "scientifically untenable studies" referenced in Star Scientific's supplemental response to RJR's Interrogatory No. 8 include all versions and editions of the paper entitled "Formation of Tobacco Specific Nitrosamines in Flue-Cured Tobacco" written by David M. Peele, Marvin G. Riddick, Mike E. Edwards, Jeff S. Gentry and Timothy B. Nestor, as well as any studies, presentations or publications that promote the same scientific theory.

VERIFICATION OF INTERROGATORY RESPONSES

I, Robert E. Pokusa, on behalf of Star Scientific, Inc., state that based on an investigation of information reasonably available at this time and in reliance on the accuracy of information supplied by others, the above Responses are true and correct to the best of my knowledge, information and belief

Executed on April 8<sup>th</sup>, 2002

By:   
Robert E. Pokusa  
General Counsel

IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF MARYLAND  
SOUTHERN DIVISION

**Certified Copy**

CASE NO. AW 01-CV-1504  
CASE NO. AW 02-CV-2504

----- X  
STAR SCIENTIFIC, INC.,  
Plaintiff,  
vs.  
R.J. REYNOLDS TOBACCO COMPANY,  
Defendant.

----- X

DEPOSITION OF DAVID PEELE

Chicago, Illinois  
November 14, 2002  
REPORTED BY: Linda D. Hansen, CSR, RDR, CRR

The videotaped deposition of DAVID PEELE, taken pursuant to the Federal Rules pertaining to the taking of depositions, taken before Linda D. Hansen, CSR, RDR, CRR, a Notary Public within and for the County of DeKalb, State of Illinois, at the Offices of Brinks, Hofer, Gilson & Lione, NBC Tower-Suite 3600, 455 North Cityfront Plaza Drive, Chicago, Illinois, on Thursday, November 14, 2002, commencing at 9:08 o'clock a.m.

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1 THE WITNESS: We would -- we  
2 would have what we would call a standard cure,  
3 which would be what we would model things  
4 against.

5 BY MR. MC MILLAN:

6 Q. Okay. So you -- oftentimes when  
7 you did these experiments, you did what you  
8 call a standard cure, and then you varied  
9 something from the standard cure to see what  
10 happened?

11 A. Yes, sir.

12 Q. Is that what you mean? Okay.

13 When you did the standard cure,  
14 did you attempt to make sure that you were  
15 doing what really happens in the real world as  
16 opposed to just something else?

17 A. Oh, no. It was -- it was a  
18 standard cure on the tobacco. The commercial  
19 tobacco that we grew at Avoca would follow the  
20 same standard cure.

21 Q. Okay. So try and -- trying to  
22 make that as real world as possible was  
23 important to you?

24 A. Yes, sir.

25 Q. Okay. Now, there were times when

1 the results you got were not what you expected;  
2 right?

3 A. Most cases they were not what I  
4 expected.

5 Q. Okay. Sometimes you got results  
6 that were inconsistent with the theory that you  
7 had at the time; right?

8 MR. GABRIC: Objection; vague.

9 BY MR. MC MILLAN:

10 Q. And that is a pretty lousy  
11 question. Let me -- let me try it again.

12 Oftentimes when you're doing  
13 this research, you -- you start with a  
14 particular hypothesis; right?

15 A. Yes.

16 Q. And -- and you do some tests to  
17 see whether or not that hypothesis proves out  
18 or doesn't prove out; right?

19 A. Correct.

20 Q. Okay. And when you have results  
21 that are inconsistent with the hypothesis, I  
22 take it one of your principles is to pursue  
23 that and try to get to the bottom of why that  
24 is?

25 A. Yes, sir.

1 Q. Okay. Is that standard scientific  
2 practice?

3 A. It is my belief it is.

4 Q. Okay. Okay. You -- you --  
5 you've until -- well, even right now, you've  
6 worked at -- at Avoca throughout the period of  
7 these TSNA studies; right?

8 A. Yes, sir.

9 Q. Now, Avoca has a couple of unique  
10 aspects, I believe, one of which is that you  
11 grow tobacco right there at Avoca; right?

12 A. Yes, sir.

13 Q. And one of the things you know is  
14 that the chemical composition of that Avoca  
15 tobacco is different from other tobaccos in  
16 some respects, is it not?

17 MR. GABRIC: Objection; vague,  
18 lack of foundation.

19 THE WITNESS: I don't know what  
20 you mean by different, in what respects?

21 BY MR. MC MILLAN:

22 Q. I mean, tobacco grown at Avoca  
23 tends to have lower TSNA than tobacco grown --  
24 other tobacco grown right around Avoca?

25 MR. GABRIC: Objection; vague,

1 lack of foundation.

2 BY MR. MC MILLAN:

3 Q. Isn't that true?

4 A. Tobacco cured in electric barns?

5 Q. No, I'm not talking about that.  
6 I'm talking about the tobacco. Here. Let me  
7 show you a couple of documents, might help.

8 (Peele Exhibits Nos. 272  
9 and 273 was marked for  
10 identification November  
11 14, 2002.)

12 BY MR. MC MILLAN:

13 Q. Let me show you what's been marked  
14 Peele Deposition Exhibit 272, which is a  
15 memorandum from Mr. Wendelboe to Mr. Hellman  
16 dated September 25th, 1997, and another  
17 document, 273, a memo from Mr. Wendelboe to a  
18 lot of different people, and attaching another  
19 memorandum.

20 MR. GABRIC: Do you have copies  
21 of those?

22 MR. MC MILLAN: Yeah.

23 BY MR. MC MILLAN:

24 Q. The first -- these -- I'm not --  
25 these documents, I don't know if you have ever



1       seen these documents before, have you? You may  
2       have, I don't know.

3             A.       I've seen them.

4             Q.       Okay. The first one, the  
5       September 25th, 1997, memo says in the second  
6       sentence, quote, "The study was intended to  
7       confirm previous findings that tobacco grown at  
8       Avoca has lower TSNA than grown locally."

9                     Do you see that?

10            A.       I see that.

11            Q.       Is that a correct statement, an  
12       accurate statement, in your view?

13            A.       Well, I can't speculate to what  
14       Mr. Wendelboe was trying to say and why he  
15       would come up with that sentence.

16            Q.       Okay. Well, let's take Mr.  
17       Wendelboe out of it.

18                     Would you agree that you have  
19       seen findings that tobacco grown at Avoca has  
20       lower TSNA than grown locally?

21            A.       I've seen findings that tobacco  
22       cured in -- in tobacco barns without the  
23       presence of nitric oxide from combustion fuels  
24       resulted in lower TSNAs.

25            Q.       I don't think that --

1           A.     And the tobacco was -- the tobacco  
2 was grown at Avoca that did that.

3           Q.     I --

4           A.     In my opinion and my belief is  
5 that the tobacco at Avoca has the same  
6 potential for producing TSNAs as tobacco  
7 produced in other areas.

8           Q.     So you don't agree that the  
9 chemical composition is different?

10          A.     Well, I didn't say about chemical  
11 composition being different. The chemical  
12 composition could be different.

13          Q.     Well, is it different?

14                   MR. GABRIC: Objection, lack of  
15 foundation.

16                   THE WITNESS: We would have to  
17 review some data to determine what different  
18 meant.

19          BY MR. MC MILLAN:

20          Q.     Okay.

21          A.     Not -- not meant -- just actually  
22 what the data is.

23          Q.     Well, let's look at data. Let's  
24 look at the other -- you've got that data  
25 right there front of you in the other exhibit.

1 type of tobacco, tobacco grown at Avoca has  
2 roughly half the TSNA as tobacco grown  
3 somewhere else?

4 MR. GABRIC: I'm going to  
5 object to that question, assumes facts not in  
6 evidence.

7 THE WITNESS: We would have to  
8 review the specific data.

9 BY MR. MC MILLAN:

10 Q. Okay. Did you also have some  
11 problem with -- with a large amount of  
12 variability in your TSNA data?

13 MR. GABRIC: Objection; vague.

14 THE WITNESS: The definition of  
15 large and large variability?

16 BY MR. MC MILLAN:

17 Q. Something you considered large.

18 A. My belief is we saw differences in  
19 treatments, but not necessarily large  
20 variability as far as -- I mean, I don't know  
21 what large variability -- there were treatment  
22 differences.

23 (Peele Exhibit No. 274 was  
24 marked for identification  
25 November 14, 2002.)

1 BY MR. MC MILLAN:

2 Q. Let me show you what's been marked  
3 Exhibit 274, Dr. Peele. That's an e-mail from  
4 Mr. Morton to you of January 24th, 1996.

5 You see in the second paragraph  
6 he says, "Particularly in the nitrosamine  
7 levels, there was a great deal of variability  
8 among the reps."

9 Do you know what he meant by  
10 that?

11 A. Let me read the article -- let me  
12 read the -- I recall the experiment. I do not  
13 recall if all the tobacco was treated and cured  
14 in the same type barns or not. And if the --  
15 if there was a barn difference, that could lead  
16 to variability in the TSNA levels.

17 Q. It says down below he took the  
18 logarithm of the nitrosamine levels to try to  
19 make the variances more stable.

20 What does that mean?

21 A. I don't know.

22 Q. Have you ever done that?

23 A. Take -- no, sir.

24 Q. Okay. Let's go to the -- we  
25 talked earlier about the work you did on NNK

1 and the medical literature has another; is that  
2 what you are saying?

3 MR. GABRIC: Objection; vague,  
4 lack of foundation.

5 THE WITNESS: I can't speak for  
6 R.J. Reynolds' philosophy or --

7 BY MR. MC MILLAN:

8 Q. Okay.

9 A. -- or point of view on this.

10 Q. All right. But -- but your  
11 belief is that NNK has been implicated in  
12 humane diseases; is that right?

13 MR. GABRIC: Objection; lack of  
14 foundation.

15 THE WITNESS: I don't know.

16 BY MR. MC MILLAN:

17 Q. So you set about to study an NNK  
18 and NNN in these tobaccos, right, the ratio?

19 A. That's one of the elements we  
20 looked at.

21 Q. Did you reach any conclusions?

22 A. Up until the time that we  
23 discovered it was nitric oxide was the primary  
24 cause, we didn't reach any conclusions.

25 Q. Okay. So that NNK study --

1 NNN/NNK -- NNK to NNN ratio study was what we  
2 might call a dry hole?

3 A. Inconclusive.

4 Q. Inconclusive, okay.

5 What about the accelerated  
6 drying study? What did you do there and --  
7 well, let's start with the conclusions and work  
8 back.

9 Did you reach any conclusions  
10 based on that?

11 A. Inconclusive again.

12 Q. Inconclusive. Another, what I  
13 would call, dry hole?

14 MR. GABRIC: Objection.

15 THE WITNESS: Not necessarily  
16 dry hole, but we could not induce TSNA  
17 formation in that tobacco. And, therefore,  
18 when we measured the treatment of the  
19 accelerated drying or cure, whatever you want  
20 to call it, against the control of the standard  
21 cure in the electric barns, or whatever we do  
22 it in, we could not see any cause and effect.

23 BY MR. MC MILLAN:

24 Q. Okay. So you -- in other words,  
25 you did not see any improvement or

1 tendency to be closer together.

2 MR. MC MILLAN: Why don't we  
3 take a short break.

4 THE VIDEOGRAPHER: Off the  
5 record at 3:56.

6 (Recess taken from 3:56 to  
7 4:14.)

8 (Peele Exhibits Nos. 307 to  
9 319 was marked for  
10 identification November  
11 14, 2002.)

12 THE VIDEOGRAPHER: Back on the  
13 record at 4:14, please proceed.

14 BY MR. MC MILLAN:

15 Q. Dr. Peele, I'm showing you Exhibit  
16 307.

17 In September of 1999, you  
18 presented an article which I think I've just  
19 shown you as Exhibit 307; is that right?

20 A. We wrote a paper to go along with  
21 our Coresta presentations.

22 Q. Right. Is that the paper?

23 A. Yes, sir.

24 Q. Okay. And that was presented in  
25 September of 1999; am I right?

1 A. The first time.

2 Q. For the first time.

3 It's since been presented how  
4 many times, would you say?

5 A. I would estimate somewhere between  
6 25 and 30.

7 Q. Is that 25 and 30 by you or 25  
8 and 30 by some Reynolds person?

9 A. I have presented all of them  
10 except for the first one, which was Dr. Dave  
11 Townsend at the Coresta meeting in Austria, and  
12 then Dr. Jeff Gentry reported -- reported it  
13 the second time at TSRC or TRCS, whatever --  
14 the Tobacco Science Research Conference  
15 somewhere outside the country; and then I  
16 presented it for the first time at the Coresta  
17 Agrophyto meeting in China.

18 And then since that time, I  
19 have presented this paper.

20 Q. Okay. By the way, are you  
21 familiar with the indirect flue-curing methods  
22 used in China?

23 A. I did not visit any  
24 tobacco-producing areas in China. We only went  
25 to one hotel the whole time I was there. So



1 the answer is no.

2 Q. Okay. All right. Now, in 1997  
3 when you were conducting experiments, and for  
4 that matter in previous years, you had been  
5 operating under the assumption that TSNAs in  
6 flue-cured tobacco were created in some fashion  
7 or another by a microbial function; is that  
8 right?

9 A. We were following the general --  
10 generally accepted hypothesis that nitrite --  
11 nitrite breaks down to NOX via denitrifying  
12 bacteria.

13 Q. Right. So you were proceeding  
14 along the hypothesis that it was the microbes  
15 that were doing it?

16 A. Yes, sir.

17 Q. Okay. And sometime between 1997  
18 and your presentation in September of 1999, you  
19 concluded that the microbes weren't doing it,  
20 is that right, in flue cured?

21 A. No, sir. We determined that the  
22 microbes could still produce some TSNAs, but  
23 the large majority of the TSNAs were produced  
24 by the presence of nitric oxide from the  
25 burning of LP gas.

1 Q. Okay. And how did you come to  
2 that conclusion?

3 A. We had been studying, as the  
4 record shows, in 1997 the effect of carbon  
5 dioxide or what we believe the effect of carbon  
6 dioxide under the premise that something about  
7 carbon dioxide was affecting TSNA levels.

8 Q. Perhaps by creating an anaerobic  
9 environment?

10 A. No; just -- just we didn't know  
11 what the mechanism was.

12 Q. But you knew one possibility was  
13 it might be creating an anaerobic environment?

14 MR. GABRIC: Objection; form,  
15 vague.

16 THE WITNESS: I do not  
17 understand your definition of anaerobic  
18 environment.

19 BY MR. MC MILLAN:

20 Q. Well, there are various RJR  
21 documents that use the term anaerobic  
22 environment. Are you aware of that?

23 A. Somewhere in this pile this  
24 morning, we may have seen that. I -- I don't  
25 -- I'd have to go back and look.

1 Q. Okay. Well, in any case, you  
2 were studying CO2, and then what happened?

3 A. One day we were -- I was, you  
4 know, contemplating the data from 1997, and it  
5 occurred to me to ask the question: What  
6 other gases are present when you burn propane  
7 gas?

8 I knew of a former college  
9 student who had worked at our facility for  
10 several summers who got her degree in chemical  
11 engineering from NC State University, and she  
12 at that time was employed by an environmental  
13 firm outside the Raleigh area. So I called  
14 Ms. Norvell and asked her if she could tell me  
15 what the other components were when I burn  
16 propane gas.

17 Q. And this was in May or June of  
18 1997?

19 A. May or June --

20 Q. I'm mean, excuse me, 1998?

21 A. June -- May or June of 1998.

22 Q. Was it in June of 1998, as best  
23 you recall?

24 A. I believe it was in June of 1998.

25 Q. Okay.

1 A. She sent me a --

2 Q. And that's when you had this idea?

3 A. That's when I had this discovery.

4 Q. This discovery.

5 A. She sent me a spreadsheet that  
6 showed from the standard EPA handbook on  
7 pollutants if you burn under conditions -- so  
8 many gallons of propane gas, you will produce X  
9 quantity of different pollutants.

10 Q. That's Exhibit 308; is that right?

11 A. That is Exhibit 3 -- Exhibit 308.

12 Q. Okay. Then what happened?

13 A. As soon as I saw the NOX present  
14 and saw that when you burn a thousand gallons  
15 of LPG, you produce 14 pounds of NOX, I took  
16 out my calculator, calculated what the amount  
17 would be in a typical commercial barn,  
18 direct-fired barn that we had at Avoca, where  
19 we had measured the gallons of fuel, took that  
20 ratio and came up with an appropriate number  
21 for how much NOX was being exposed to tobacco.

22 Q. And what was that number?

23 A. Well, looking at the next -- there  
24 is another spreadsheet that goes with this --

25 MR. GABRIC: Do you have a

1 copy of 308? Are these all the ones you've  
2 marked? Thank you.

3 THE WITNESS: The number -- the  
4 number generally is between two and four pounds  
5 of NOX per cure depending on the number of  
6 gallons of fuel that the individual person  
7 curing the barn of tobacco is going to use.

8 BY MR. MC MILLAN:

9 Q. Okay. So then what did you do?

10 A. We had already, prior to that  
11 time, back in the earlier part of, you know,  
12 late spring, early -- I mean, early spring,  
13 late winter had looked at modifying two of our  
14 tobacco barns, two of our electric tobacco  
15 barns to put in direct-fired propane burners --

16 Q. Why?

17 A. -- and we --

18 Q. Why had you done that?

19 A. Why did we do that?

20 Q. Yeah. Why did you look at that?

21 A. We were still -- at that time we  
22 were doing that, we were still under the  
23 premise that carbon dioxide was going to have  
24 some affect, and so we went out and -- and  
25 talked to a supplier, who was BulkTobac in

1 Charlotte, North Carolina --

2 THE REPORTER: I'm sorry. Was  
3 what?

4 THE WITNESS: BulkTobac and  
5 Frank Horn, Senior, who was the owner of the  
6 company, and talked with Frank about if I could  
7 buy a small direct-fired propane burner that  
8 would approximate the same Btu's that our  
9 electric furnaces were in our electric barns.

10 And subsequently, we bought  
11 those -- those burners and installed the  
12 burners in our barns.

13 So the only change we made in  
14 those barns was to lower the fans, as you saw  
15 in your inspection, and put the propane burner  
16 above the fan to make the --

17 BY MR. MC MILLAN:

18 Q. Lower them, you mean --

19 A. Physically drop it down in the  
20 barn.

21 Q. Less -- less high off the ground?

22 A. Less high off the ground.

23 Q. Okay. And the reason you were  
24 doing that was you wanted to get rid of CO2?

25 A. The reason I lowered the -- the

1       --

2           Q.       No; the reason you were getting  
3 these --

4           A.       No. The reason I got them is  
5 because I wanted to introduce CO2 --

6           Q.       Oh.

7           A.       -- into those electric barns, in  
8 that same barn configuration.

9                       So now the only thing would be  
10 -- difference would be I would have two  
11 electric barns and two direct-fired propane  
12 barns sitting side by side that I knew were --  
13 in all other facets were similar.

14          Q.       You wanted to do that so you  
15 could see whether or not there was any effect  
16 of CO2?

17          A.       Yes, sir.

18          Q.       Okay. So then you -- and before  
19 you got on with any of that experiment --

20          A.       Before I got on --

21          Q.       -- you had this idea about NOX  
22 and you contacted Ms. Norvell?

23          A.       We contacted Ms. Norvell.

24          Q.       Then what happened?

25          A.       We really -- there was nothing we

1       could do until we started getting tobacco that  
2       we could harvest at Avoca.

3                       So we ran the first series of  
4       experiments in early August, where we took  
5       tobacco in one electric barn, two propane  
6       barns, two direct-fired that we'd converted,  
7       and one or two -- I don't remember exactly,  
8       but I know there was at least one --  
9       direct-fired commercial barns at Avoca that we  
10      had been currently curing in.

11                      The tobacco was not produced on  
12      Avoca. The tobacco was produced by a gentleman  
13      named Ari Taylor on his farm that he harvested  
14      tobacco and brought it to us.

15                      Our people racked the tobacco  
16      up, put the tobacco in the boxes, uniformly  
17      loading the boxes so that everything was  
18      uniform, and we cured the tobacco. We measured  
19      the -- you know, the temperatures like we would  
20      normally do on any -- on any cure that we're  
21      doing. We also took samples that -- into that  
22      and measured TSNA.

23                      Q.       Okay. Then what -- what did you  
24      do?

25                      A.       After that we repeated the



1 experiment again, and we repeated the  
2 experiment the next time --

3 Q. The -- the experiment you repeated  
4 is the same experiment?

5 A. Same experiment, same.

6 Q. Okay. So -- and this is the --  
7 the experiment reported at the bottom of the  
8 fourth page of your article --

9 A. One, two --

10 Q. -- or are you talking about  
11 something else?

12 A. Hold on. That is the -- that is  
13 the data that we reported.

14 Q. Okay. Then -- then what did you  
15 do?

16 A. After the -- we repeated that the  
17 second time, and I -- I do not recall the --  
18 you know, exactly the dates. We had a meeting  
19 in Winston-Salem, at which time Dr. Gentry was  
20 -- Dr. Jeff Gentry was present, Dr. Dave  
21 Townsend was present, Dr. Gary Burger, who was  
22 the executive VP of R & D was there; I don't  
23 really recall if Mr. Borschke was there or not,  
24 and my immediate boss was Mr. Frank Sellers.

25 And we disclosed to them that

1 we had worked this series of experiments that  
2 proved that it was the addition of -- or the  
3 elimination of nitric oxide that prevented  
4 TSNAs, that gave us low TSNAs.

5 Q. Okay. Was this -- I'm going to  
6 show you Exhibit 309.

7 MR. GABRIC: Could I have --  
8 thank you.

9 BY MR. MC MILLAN:

10 Q. This is a memorandum from you  
11 dated September 4th, 1998.

12 Was this meeting you're  
13 describing before or after this meeting?

14 A. It would have been before this.

15 Q. Do you remember the date of the  
16 meeting?

17 A. No, sir.

18 Q. And -- and what did you say you  
19 had --

20 A. We presented the results of what  
21 we had done with these -- at least the first  
22 cure, and I can't honestly remember whether it  
23 was the first cure or the second cure.

24 But we -- we showed them the  
25 data where we had found that there was NOX in

1 the combustion gases, and we showed them data  
2 where we had cured the tobacco in the electric  
3 barns, the small eight red barns that had been  
4 converted to direct propane, or direct-fired  
5 propane, and also the commercial barns at Avoca  
6 that were direct-fired propane.

7 Q. But at this point you didn't know  
8 whether the reason for the difference was the  
9 NOX or the CO2, did you?

10 A. Yes, I did. I knew it was NOX.

11 Q. Why is that?

12 A. Because of the generally accepted  
13 hypothesis that it's NOX that reacts with  
14 TSNAs, that reacts with the alkaloids to form  
15 TSNAs.

16 Q. Well, I thought you said a few  
17 minutes ago that you had a hypothesis that it  
18 was this presence of CO2 that was creating  
19 TSNAs.

20 A. I did up until the time I talked  
21 to Ms. Norvell.

22 Q. Well, okay. But at one point you  
23 had a hypothesis that it was CO2 that was  
24 creating TSNAs, and at another point you had a  
25 hypothesis that it was NOX that was creating

1 TSNAs; right?

2 A. That's correct.

3 Q. But the first set of experiments  
4 you did didn't tell you the answer to which it  
5 was, did it?

6 A. The first set of experiments told  
7 me that it was the presence of NOX.

8 Q. Well, why did it tell you it was  
9 the presence of NOX as opposed to the presence  
10 of CO2?

11 A. Because the only difference  
12 between those -- the measurable difference was  
13 the introduction of NOX due to the direct fire  
14 of propane gas.

15 Q. But you didn't introduce any --  
16 you didn't introduce any separate NOX in these  
17 first experiments, did you?

18 A. No, it was just what was come off  
19 the burner.

20 Q. Right. And what came off the  
21 burner was NOX and CO2; right?

22 A. That's correct.

23 Q. So if someone had walked up to  
24 you and said, "Well, you know, Dr. Peele, your  
25 NOX theory is really crazy; it -- it's got to

1 be CO2 that's causing it," are you suggesting  
2 you had some experiment that you'd done that  
3 could disprove that?

4 A. No. I'm suggesting that they told  
5 me that I was crazy to believe it was CO2 that  
6 was doing it.

7 Q. Okay. But the first experiment  
8 that you actually did to demonstrate that it  
9 was NOX as opposed to CO2, was in September of  
10 1998, is that right --

11 MR. GABRIC: Objection; vague.

12 BY MR. MC MILLAN:

13 Q. -- in response to this memo?

14 MR. GABRIC: Referring to 309?

15 MR. MC MILLAN: Yes, not that  
16 memo.

17 THE WITNESS: 309.

18 BY MR. MC MILLAN:

19 Q. 309, right.

20 A. No, I believed that on the day  
21 that Dana Norvell told me that there was NOX  
22 in that tobacco, that would be the primary  
23 source of TSNA formation in flue-cured tobacco.

24 Q. Well, I understand you said that's  
25 what you believed, but my question is: Isn't

1 it true that on September 4th, 1998, you  
2 proposed an experiment to evaluate the effect  
3 of NOX gases on TSNAs?

4 A. We did do an experiment, as is  
5 described on this page --

6 Q. And this is the first NOX test?

7 A. -- to see that if we could --  
8 well, it is the first NOX test that we used an  
9 external source of nitric oxide other than the  
10 burner.

11 Q. Right. So you then went ahead  
12 and performed some version of a NOX test;  
13 right?

14 A. We performed this, this test as --

15 Q. Actually, you didn't perform this  
16 test, did you? This test for the last 24  
17 hours of yellowing and first 24 hours of leaf  
18 drying, you were going to introduce NOX, but  
19 that's not what you did, is it?

20 A. No. We changed -- because we  
21 could not get a flow rate such that we could  
22 cover it during that 24-hour period.

23 Q. What --

24 A. That 48-hour period.

25 Q. What do you mean, you could not

1 get a flow rate?

2 A. The metering valves that we had  
3 access to -- to us, at Avoca, in this time  
4 period, when we went out to calibrate those,  
5 the lowest readings that we could get down to  
6 were approximately one pound in a 24-hour  
7 period.

8 Q. All right. So what exact test  
9 did you then run?

10 A. We ran an exact test where we  
11 introduced -- well, let's see. We introduced  
12 1.8 kilograms of nitric gas during the last 24  
13 hours of the yellowing period.

14 Q. And did you introduce it all at  
15 once or did you introduce it over --

16 A. We introduced it over a 24-hour  
17 period.

18 Q. So 1/24 of it every hour?

19 A. It was -- it was calibrated out  
20 just to give a constant flow so that over the  
21 24-hour period, it would deliver 1.8 kilos.

22 Q. Did you do something to the barn  
23 to make sure the NOX would stay in there?

24 A. Closed the damper.

25 Q. Did you seal it somehow?

1 A. No, sir, not that I recall.

2 Q. Okay. And then at the same time,  
3 you ran a control barn with one of the  
4 electric barns that was just operated normally?

5 A. Yes, sir.

6 Q. Okay. And then so that was one  
7 test that you ran.

8 And then you ran that test a  
9 second time or a similar test a second time;  
10 am I right?

11 A. Without looking at my --

12 Q. Here. I can --

13 A. If you got the big data sheet.

14 Q. Well, let's just start with your  
15 article.

16 You see right in the -- in the  
17 middle of -- there is a page with table 2?

18 A. Yes, sir.

19 Q. Do you see table 2 there?

20 A. I'm on that page.

21 Q. Okay. That -- that was the first  
22 NOX experiment results; right?

23 MR. GABRIC: Objection to the  
24 form of the question.

25 THE WITNESS: Table 2 was the



1 first experiment under which exogenous NOX was  
2 added to the tobacco.

3 BY MR. MC MILLAN:

4 Q. Yeah. And you referred to that  
5 as the first NOX experiment?

6 MR. GABRIC: Objection --

7 BY MR. MC MILLAN:

8 Q. Right?

9 MR. GABRIC: -- to the form of  
10 the question, puts words in the witness' mouth.

11 THE WITNESS: There was an  
12 experiment before we started adding exogenous  
13 NOX to it where we cured the tobacco twice  
14 with just electric and direct-fired propane in  
15 a standard, commercial direct-fired barn at  
16 Avoca.

17 BY MR. MC MILLAN:

18 Q. And that's this table 1?

19 A. That's in table 1.

20 Q. Then after the -- after table 2,  
21 there is some language that says, starting in  
22 the second sentence, "Tobacco was loaded into  
23 two of each electric R & D barns," et cetera,  
24 "as in the previous experiment, the tobacco was  
25 yellowed for 48 hours," et cetera, "the tobacco

1 was sampled just prior to any" X -- any NOX  
2 treatment and subsequently on a 12-hour  
3 schedule. Finally, the tobacco was sampled at  
4 the end of cure."

5 So that was a third test you  
6 ran; correct?

7 A. Yes, sir.

8 Q. And then you graphed those -- the  
9 results of the third test in figure 2?

10 A. Yes, sir.

11 Q. Okay. Now, in each of these  
12 three tests -- the first one what you did was  
13 just an LP gas versus electric, and then the  
14 second and third tests, where you introduced  
15 NOX gases.

16 In each of those three tests  
17 you had one electric barn they used as a  
18 control; is that right?

19 A. Yes, sir.

20 Q. And were -- was that set up the  
21 same in each of the three experiments?

22 A. The same barn or the same what?  
23 Set up -- set up the same --

24 Q. Same -- you cured it the same,  
25 you tried to do everything the same?

1           A.     We tried to do everything the  
2 same.

3           Q.     As between all three?

4           A.     Yes, sir.

5           Q.     Okay. And in -- in one of those  
6 -- in the first test you report zero TSNA.

7                     Now, that's not a -- a real  
8 number, I take it, because what you really mean  
9 is that it was simply below detection?

10          A.     Non-detect would be -- you could  
11 substitute -- you could put non-detect there.

12          Q.     Right. And your detection limits  
13 were what?

14          A.     Again, I told you I -- I'm not a  
15 chemist, so I can't speak on detection limits.

16          Q.     Okay. But in any case, we can be  
17 pretty confident that TSNA was higher than  
18 zero?

19          A.     It was non-detect.

20          Q.     Okay. And then in the second  
21 test, your electric control barn showed up with  
22 one part per million; is that right?

23          A.     Yes, sir.

24          Q.     And do you know what it turned up  
25 in the -- in the third test?

1 Here, I will give you a little  
2 help. Take a look at Riddick Exhibit 236, and  
3 if you go to --

4 MR. GABRIC: Do you have a --  
5 Rick, may I have a copy?

6 BY MR. MC MILLAN:

7 Q. There is a page where you will  
8 find NOX test 2, end of cure.

9 Have you got that?

10 A. NOX test 2, end of cure. That's  
11 what you asked about.

12 Q. That's the -- that's the -- that's  
13 the results of this third test, right, the  
14 second NOX text, but third test overall?

15 MR. GABRIC: In fairness to me,  
16 I would appreciate having a copy of the  
17 document before questioning.

18 MR. MC MILLAN: I'm sorry. I  
19 just don't happen to have one.

20 MR. GABRIC: I think Jonathan  
21 has one.

22 MR. MC MILLAN: Oh.

23 MR. GABRIC: Where are you,  
24 Dave?

25 THE WITNESS: NOX test 2, end

1 of cure.

2 BY MR. MC MILLAN:

3 Q. Okay. So that was the third test  
4 that's reported in -- in your article on figure  
5 2; is that right?

6 MR. GABRIC: Could I have that  
7 question back, please?

8 (Question read.)

9 THE WITNESS: Okay. Sir, what  
10 is the question?

11 BY MR. MC MILLAN:

12 Q. The results of the second NOX test  
13 are what are reported in figure 2 of your  
14 article?

15 A. Figure 2 of the article is NOX  
16 test No. 3.

17 Q. Right -- no, it's NOX test No. 2  
18 -- well, it's what you call No. 3, but it's --  
19 let's go back to square one here.

20 You did a test in August in  
21 which you didn't introduce any NOX; right? And  
22 that's reported in table 1 of your article.

23 A. Without going back and looking at  
24 the numbers on table 1 in the article, I do  
25 not recall whether that is the average of the

1 test on this exhibit -- really, Exhibit 236  
2 being the test started on 8/13, the 8/13/1998  
3 and the 8/24/1998.

4 Q. Okay. And then in any case,  
5 there was a second test, and you've already  
6 described the second test. It shows up, I  
7 believe, on the page NOX test 1, and that's  
8 reported in table 2 of your article; right?

9 MR. GABRIC: I will object to  
10 the form of the question.

11 BY MR. MC MILLAN:

12 Q. Do you see NOX test 1 on 9/21/98?  
13 Barn 20 was your control barn, and the TSNA  
14 results are 1.4, .5, 1.6 and .4? Do you see  
15 that?

16 MR. GABRIC: Do you see that?  
17 Where are you referring to?

18 Would you read that back to me,  
19 please.

20 MR. MC MILLAN: Here, let me  
21 see if I can find it for you.

22 BY MR. MC MILLAN:

23 Q. Okay. Let's look at table 2 of  
24 your article where you're showing TSNAs of 1  
25 for your control barn, and I believe that shows

1 up as sample 78A, 79A, 80A and 81A on Exhibit  
2 236; is that right?

3 MR. GABRIC: I just caution  
4 you, Dr. Peele, you are entitled to look at  
5 whatever documentation you need to look at.

6 THE WITNESS: And the -- and  
7 the question, so I understand the question, is?

8 BY MR. MC MILLAN:

9 Q. The data you used, the data that  
10 was the source data for table 2 of your  
11 article is the data that shows up in Riddick  
12 Exhibit 236 of sample 78A, 79A, 80A and 81A?  
13 I'm just asking for your confirmation of that.

14 A. Yes, sir.

15 Q. And the table that formed the  
16 basis -- excuse me -- the data that formed the  
17 basis for figure 2 of your article, figure 2,  
18 which is the graph, is entitled NOX test 2,  
19 end of cure, that is on the next page -- NOX  
20 test 2? NOX test 2, end of cure.

21 And for the control barn on the  
22 NOX -- the control barn that you used that  
23 shows up in figure 2 of the article, that  
24 comes from the data for samples 126A, 127A,  
25 128A and 129A on Exhibit 236; correct?

1 A. No, sir.

2 Q. Well, where is the data that's --

3 A. It is NOX test 3.

4 Q. What was NOX test 2?

5 A. The repeat of NOX test 1.

6 Q. NOX test 2 was a repeat of NOX  
7 test 1, NOX test -- okay.

8 Done the same way?

9 A. Done the same way.

10 Q. Okay. What was your control data  
11 for NOX test 3?

12 A. If you look at -- on -- I don't  
13 know what -- on the page that has NOX test 3,  
14 60 hours yellowing, gas introduced starting at  
15 36 hours and running for the last 24 hours at  
16 zero hours, it talks about the one, two, three,  
17 four -- the fifth column over talks about barn  
18 numbers, 19, 20 and 26.

19 26 is a four-rack electric barn  
20 at Avoca.

21 Q. Well, according to your article in  
22 this second NOX test, one barn received one  
23 pound of NOX and the other barn received four  
24 pounds of NOX.

25 A. Uh-huh.



1 Q. That's the amount that you put in  
2 the small electric barns; correct?

3 A. That's the amount we put in barns  
4 19 and 20. Barn 19 received the one X and  
5 barn 20 received the four X.

6 Q. Okay. Let's go back to NOX test  
7 2.

8 The TSNA results that you  
9 observed on your control barn in that test  
10 ranged from 2 to 3.2; is that right?

11 A. Yes, sir.

12 Q. Why didn't you report those  
13 results in your article?

14 A. We elected just to report the  
15 first -- the first test we did.

16 Q. All right. Why did you elect to  
17 leave out the higher results?

18 A. I don't think there is a specific  
19 reason.

20 Q. When you conducted these NOX tests  
21 -- well, actually, first of all, let me show  
22 you what's been marked as Peele Exhibit 310.  
23 Peele Exhibit 310 is a handwritten document.

24 Do you recognize the  
25 handwriting?

1 MR. GABRIC: May I have a copy  
2 of that? This is -- thank you.

3 BY MR. MC MILLAN:

4 Q. Do you recognize that handwriting?

5 A. I can't definitively say which of  
6 two persons it could be.

7 Q. Okay. Which are the two persons?

8 A. One is Mike Edwards and the other  
9 one is Herbert Copeland.

10 Q. Okay. This appears to be a set  
11 of some additional testing dated September  
12 22nd, 1998, for 4.3 pounds of NOX over 24  
13 hours. Do you know what these results are?

14 I don't think you are going to  
15 find these reports -- these results reported in  
16 Exhibit 236. And you anticipated my next  
17 question, I think, in your pause, Dr. Peele,  
18 which is: Why not?

19 A. Why not?

20 Q. Does this appear to be another  
21 test that was run, same test, this NOX addition  
22 test?

23 A. It was not another experiment run.

24 What I can't tell from this --  
25 from this document is whether or not this was

1 just a grab sample taken at the end of the  
2 cure before the tobacco was ordered back up.

3 Q. Well, in any case, for the control  
4 barn the -- the TSNA results were 1.6 parts  
5 per million; is that right?

6 A. R No. 20 electric without NOX, 1.6  
7 part per million.

8 Q. Okay. So are you saying this is  
9 some other -- what -- what test is this? Does  
10 it correspond to any of the tests we've been  
11 talking about?

12 A. From the information presented, I  
13 cannot tell you whether it responds to what we  
14 call NOX test 1 or NOX test 2.

15 Q. Well, it doesn't seem to  
16 correspond to either one, does it, because it  
17 says TSNA's are 1.6.

18 Do you know of any way this  
19 test corresponds to any other test?

20 A. I cannot tell from this  
21 information how the data presented in that  
22 corresponds to the data over here. I don't  
23 have -- I don't have any other information in  
24 front of me.

25 Q. Okay. Peele Exhibit 311 is a

1 different version, some of the same test data.

2 Do you recognize that  
3 handwriting?

4 A. Yes, sir, that's my handwriting.

5 Q. Where it says "first NOX gas," is  
6 that your handwriting?

7 A. Yes, sir.

8 Q. What's the date of the first NOX  
9 gas test according to that?

10 A. Well, there is no date on this.

11 Q. What's the sample number?

12 A. 70A.

13 Q. Okay. That would correspond to  
14 sample 78 on Exhibit 236; is that right?

15 A. Riddick 236.

16 Q. So that would be September 21st?

17 A. Grab sample.

18 Q. September 20 -- the date is  
19 September 21st; is that right? No.

20 We are talking at 78, I thought  
21 you said.

22 A. 70A.

23 Q. Oh, 70A, sorry. I have the wrong  
24 date. So, yeah, September 21st, grab sample.

25 Okay. I'm going to show you

1 Exhibit 312. That's some additional data that  
2 you received from Ms. Norvell on about  
3 September 23rd, 1998, according to the fax; is  
4 that right?

5 A. Yes, sir.

6 Q. And if you look at the table  
7 1.5-1, do you see some NOX data listed there?

8 A. Yes, sir.

9 Q. Did you use any of that for  
10 purposes of calculating how much NOX to  
11 introduce into your barns in your 1998  
12 experiments?

13 A. The best I can tell from the line  
14 as through the line, it would have been the  
15 propane emission factor for commercial bollers.

16 Q. 14 pounds?

17 A. 14 pounds.

18 Q. Okay. Now, what you introduced  
19 into your barns was NO gas; right? It wasn't  
20 NO2, it wasn't NO 3; it was NO?

21 A. It was NO.

22 Q. Pure NO; is that right?

23 A. In the cylinder, it was pure NO.

24 Q. Right. But this data is expressed  
25 in the form of NO2, isn't it? If you look at

1 figure -- or footnote F?

2 A. That's what it says.

3 Q. So, in fact, if you were using  
4 NO2 data that you got from Ms. Norvell but  
5 introduced NO into your barns, you were  
6 actually introducing quite a bit more NO than  
7 was justified by the calculation; is that  
8 right?

9 MR. GABRIC: Could I have the  
10 question back, please?

11 MR. MC MILLAN: Let me -- let  
12 me ask the question again.

13 BY MR. MC MILLAN:

14 Q. NO has quite a bit more nitrogen  
15 in it than NO2 on a weight basis; correct?

16 MR. GABRIC: Objection;  
17 foundation.

18 BY MR. MC MILLAN:

19 Q. Do you know that?

20 A. Chemistry would tell you that.

21 Q. Okay. And would you agree with  
22 me, Dr. Peele, that if you used -- if you  
23 assumed this 14 pounds was based on NO instead  
24 of NO2, then you made an incorrect calculation?

25 MR. GABRIC: Objection; form of

1 the question, vague.

2 THE WITNESS: I would need to  
3 go back and review the data sheets from the  
4 time period where I did these calculations.

5 BY MR. MC MILLAN:

6 Q. As you sit here today, do you  
7 believe that you based the calculations on NO  
8 rather than NO2?

9 MR. GABRIC: Objection; calls  
10 for speculation.

11 THE WITNESS: I don't recall.  
12 I'll have to check the sheets.

13 BY MR. MC MILLAN:

14 Q. Now, as a -- as a practical  
15 matter, Dr. Peele, apart from any mistakes you  
16 made with respect to the NO calculation, you  
17 intentionally introduced more NO into these  
18 barns than you would have expected in a normal  
19 direct-fired cure; correct?

20 MR. GABRIC: I will object to  
21 the form of the question.

22 THE WITNESS: The design of the  
23 experiment was such that typically when you're  
24 doing experiments, you look at a -- a dose  
25 effect.

1 BY MR. MC MILLAN:

2 Q. What do you mean by a dose  
3 effect?

4 A. If -- if the recommended dose is  
5 X, typically you look at half X, one X, two X,  
6 four X, eight X, multiply it up in multiples.

7 Q. And the idea is if you put  
8 something in at two X and then you put it in  
9 at one X, you want to see if the TSNA results  
10 are twice as high in the two-X world as they  
11 are in the one-X world?

12 A. You want to see if there is a --  
13 a response to the more NOX you add, if there  
14 is more TSNAs.

15 Q. Okay. Well, you knew -- you made  
16 a calculation as to exactly how much NOX was  
17 -- would have been introduced in a direct-fired  
18 barn; correct?

19 A. I made a calculation based on a  
20 range -- a -- what I believe to be an average  
21 value for the gallons of propane gas that would  
22 be burned in a typical cure.

23 Q. Right. And that was -- according  
24 to your article, it was .18 kilograms?

25 A. The article now --



1 Q. Table 1.

2 A. In the little LP gas, that's  
3 correct.

4 Q. Okay. So you knew when you were  
5 running these experiments that if you wanted to  
6 introduce the amount of NOX gas that would most  
7 closely represent what you'd actually expect to  
8 see in the real world, the correct amount was  
9 a little less than two-tenths of a kilogram; is  
10 that right?

11 A. Based on the calculation.

12 Q. And the -- have you ever run an  
13 experiment, Dr. Peele, in which you used about  
14 two-tenths of a kilogram?

15 A. No, sir.

16 Q. Have you ever asked anybody to run  
17 such an experiment?

18 A. No, sir.

19 Q. Do you know of anybody who has  
20 run such an experiment?

21 A. Not that I recall.

22 Q. If you wanted to determine what  
23 the real effect of .2 kilograms of NOX was in  
24 a barn, why wouldn't you run that experiment?

25 A. Again, it goes back to the

1 equipment that was available to me the day that  
2 I was running the experiment, and we wanted --  
3 in -- in our way of thinking, we had a zero  
4 value, we had a two-tenths value, so we wanted  
5 to move it on up on this multiple factors of  
6 the dosage rate.

7 Q. And, in fact, this two-tenths  
8 factor in a real barn would have been  
9 introduced over a period of about six days;  
10 right?

11 A. The length of the cure.

12 Q. So you're really talking about .03  
13 kilograms per day; right?

14 A. No, sir, because it depends on how  
15 much the burner is burning.

16 Q. Okay. Well, on average what would  
17 you say it was?

18 A. Well, you can't say on average  
19 because it varies during the cure.

20 Q. Okay. Well, during the cure, what  
21 would be the biggest day, let's call it the  
22 high point?

23 You take this .18 kilograms and  
24 spread it over six days, what would be the day  
25 on which you had the absolute highest amount of

1 NOX gas?

2 A. It would be during the time that  
3 you're ramping the temperature and increasing  
4 the -- increasing the temperature.

5 Q. How much would you expect that  
6 would be on your maximum day?

7 A. I -- I'd have to figure out some  
8 way to calculate that.

9 Q. Well, give us an --

10 A. I'd have --

11 Q. -- an approximation.

12 MR. GABRIC: Objection;  
13 foundation.

14 THE WITNESS: I'd have to know  
15 how many gallons of fuel were burned during --  
16 during that day period.

17 BY MR. MC MILLAN:

18 Q. Okay. Well, just for today's  
19 purposes, we'll just agree that on any given  
20 day, then, the real NOX in the real world  
21 would have been significantly less than .18,  
22 significantly less, in other words, than  
23 approximately two-tenths of a kilogram?

24 MR. GABRIC: Object to the form

25 --

1 BY MR. MC MILLAN:

2 Q. Is that right?

3 MR. GABRIC: Object to the form  
4 of the question.

5 THE WITNESS: Repeat your  
6 question, please.

7 BY MR. MC MILLAN:

8 Q. Well, I -- we can probably -- I  
9 think the mathematics will probably work out  
10 for themselves, Dr. Peele, so let me just go  
11 on.

12 In fact, as you said, you never  
13 used two-tenths or any number very close to  
14 two-tenths, did you?

15 MR. GABRIC: Object to the form  
16 of the question; it's vague, ambiguous,  
17 mischaracterizes the record.

18 BY MR. MC MILLAN:

19 Q. How many kilograms did you  
20 introduce?

21 MR. GABRIC: Same -- same  
22 objections.

23 THE WITNESS: The paper states  
24 that in one test we introduced 1.8 kilos of  
25 NOX gas during a 24-hour period, and in the

1 second test we introduced .5 kilos of NOX gas  
2 and also 1.8 kilos of NOX gas.

3 BY MR. MC MILLAN:

4 Q. Now, when you introduced the high  
5 side of that, you got a huge amount of TSNAs;  
6 right?

7 MR. GABRIC: Object to the form  
8 of the question.

9 THE WITNESS: According to  
10 figure 2, at the high level, we were -- TSNAs  
11 greater than 100 parts per million.

12 BY MR. MC MILLAN:

13 Q. What were the amounts again that  
14 you said you introduced, the high amount and  
15 the low amount?

16 A. From Bats [sic] article 9232.

17 THE REPORTER: From which  
18 article, I'm sorry?

19 THE WITNESS: I mean, from the  
20 Bats-numbered document of 9232, we introduced  
21 1.8 kilos of NOX gas during 24-hour periods,  
22 and we introduced, for the second experiment,  
23 another experiment, .45 kilos and 1.8 kilos.

24 BY MR. MC MILLAN:

25 Q. Okay. So in one version you

1 introduced four times what you introduced in  
2 the other version?

3 A. In the second -- in the experiment  
4 on the second example I gave, we introduced  
5 four times what I did.

6 Q. Okay. Did you get four times the  
7 TSNAs?

8 A. Well, again, from figure 2 we've  
9 got roughly 100 parts per -- a little over 100  
10 to maybe 110 parts per million, to interpolate  
11 the graph; and on the other one we were  
12 plotting at the end of cure -- I don't know,  
13 10, 12, 14, I don't know what the number is,  
14 10 maybe.

15 Q. So, in other words, when you had  
16 four times -- well, actually, it's not four  
17 times the real world, it's -- how many times  
18 the real world is that?

19 A. I've not calculated it, sir.

20 Q. Okay. Did you get the ratio of  
21 NNN and NNK that you expected?

22 MR. GABRIC: Object to the form  
23 of the question.

24 THE WITNESS: I'd have to go  
25 back and review the data because we reported on

1 this data in TSNAs.

2 BY MR. MC MILLAN:

3 Q. The TSNA data -- the ratio of NNK  
4 to NNN that you expect in a direct-fired  
5 environment is -- you expect higher NNK; right?

6 A. That is what we generally saw.

7 Q. All right. So if it's -- if it's  
8 the nitric oxide gases in this direct-fired  
9 environment that are causing TSNA, would you  
10 expect to see higher NNK?

11 MR. GABRIC: Objection; lack of  
12 foundation.

13 THE WITNESS: We saw higher  
14 values of NNN than NNK in the experiments that  
15 we added the NOX gas.

16 BY MR. MC MILLAN:

17 Q. But that doesn't answer my  
18 question, Dr. Peele.

19 My question was: If it was  
20 nitric oxide that was causing TSNAs, then you  
21 would expect that there would be more NNK  
22 produced; right?

23 MR. GABRIC: Object.

24 BY MR. MC MILLAN:

25 Q. More NNK, less NNN?

1 MR. GABRIC: Object to the form  
2 of the question, lack of foundation.

3 THE WITNESS: Not being a  
4 chemist, I cannot speak for how stable -- for  
5 the way I understand my layman's terms of  
6 chemistry, is that NO is not a stable form of  
7 nitric oxide; and, therefore, it changes almost  
8 instantaneously in the atmosphere to other  
9 species.

10 BY MR. MC MILLAN:

11 Q. Changes almost instantaneously to  
12 NO2, doesn't it?

13 MR. GABRIC: Object to the form  
14 of the question; no foundation, calls for this  
15 witness now to speculate.

16 THE WITNESS: I don't know.

17 BY MR. MC MILLAN:

18 Q. But in any case, you had studied  
19 the NN -- the ratio between the NNK and NNN in  
20 flue-cured tobacco that was direct-fire cured.  
21 You'd studied that; right?

22 MR. GABRIC: Object to the form  
23 of the question.

24 THE WITNESS: We'd observed  
25 data.



1 BY MR. MC MILLAN:

2 Q. Well, you studied the specific  
3 issue of the ratio. That was one of the  
4 experiments that you specifically did in 1995;  
5 correct?

6 A. But I do not recall the exact  
7 conclusions from that experiment.

8 Q. But you know for a fact, because  
9 you've been in this business for years and  
10 years and seen this data for years and years,  
11 that in a direct-fired environment, you expect  
12 to see NNK values higher than NNN in flue-cured  
13 tobacco; correct?

14 A. General rule of thumb, yes.

15 Q. Right. And so if you were  
16 conducting a test that accurately mimicked what  
17 happens in the real world in a direct-fired  
18 environment, you would expect to see NNK higher  
19 than NNN, wouldn't you?

20 MR. GABRIC: Objection; calls  
21 for speculation, no foundation.

22 THE WITNESS: I don't have the  
23 background in chemistry to be able to tell you  
24 how the species are going to move around.

25 BY MR. MC MILLAN:

1 Q. Well, did you observe the fact in  
2 your results, Dr. Peele, that instead of NNK  
3 being higher than NNN, it turned out that NNN  
4 was roughly ten times higher than NNK?

5 I think you can find that on  
6 NOX test 1. Do you got that?

7 A. NOX test 1, the statement you made  
8 is true for samples 70 -- for barn 19, but it  
9 is not true for barn 82.

10 Q. In barn 82 --

11 A. I mean, barn 21.

12 Q. In barn 21 it's not ten times  
13 higher, it is only something about five times  
14 higher; is that right?

15 A. That's what it looks like from the  
16 math.

17 Q. Okay. And by comparison, when you  
18 tried to just have a regular direct-fired  
19 environment, that's -- shows up in -- in the  
20 sample 86; right?

21 A. Barn 22.

22 Q. Barn 22.

23 And there, again you see NNK  
24 values roughly twice as high as NNN values;  
25 right?

1 A. That's what the data shows.

2 Q. Have you ever tried to get to the  
3 bottom of the fact that although direct-fired  
4 environments seem to have high NNK values, your  
5 NOX test had NNN values that were five to ten  
6 times higher than NNK? Have you ever tried to  
7 figure out why that happened?

8 A. I did not try to figure that out.

9 Q. Did you ever figure out why in  
10 the TSNAs that you were reporting, at least in  
11 some of the cases, 90 percent of it was NNN?

12 MR. GABRIC: Object to the form  
13 of the question. It's vague.

14 THE WITNESS: After we did  
15 these series of experiments, I do not recall  
16 going back and looking at those ratios ever  
17 again.

18 BY MR. MC MILLAN:

19 Q. You just published the same data  
20 over and over and over again and didn't do any  
21 further work; is that right?

22 MR. GABRIC: Object to the form  
23 of the question, it's also argumentative.

24 THE WITNESS: I do not recall  
25 repeating that experiment again in these

1 subsequent years.

2 BY MR. MC MILLAN:

3 Q. Now, would you expect -- based on  
4 your scientific background that if NOX is  
5 really reacting the way you think it is, would  
6 you expect that there would be more of that  
7 reaction where the temperatures were higher?

8 MR. GABRIC: Objection; lack of  
9 foundation.

10 THE WITNESS: I do not know.

11 BY MR. MC MILLAN:

12 Q. You're not aware of the fact that  
13 a chemical reaction of this sort is going to  
14 proceed faster when the -- under higher  
15 temperatures and slower under lower  
16 temperatures?

17 A. That's not --

18 MR. GABRIC: Objection.

19 THE WITNESS: -- my field of  
20 expertise.

21 BY MR. MC MILLAN:

22 Q. So that subject has never come up?

23 A. Not that I recall.

24 Q. Have you ever noticed that your  
25 results show just the opposite?

1 talking to that you've never actually  
2 introduced into a barn the amount of NOX that  
3 you'd actually expect in the real world?

4 MR. GABRIC: Objection; form of  
5 the question, mischaracterizes the record.  
6 He's got direct-fired barns in his paper.

7 THE WITNESS: My belief is that  
8 the paper -- that the data presented is  
9 accurate.

10 BY MR. MC MILLAN:

11 Q. Well, my question is: Have you  
12 ever told any -- any of the people you were  
13 speaking to on these 25 or 30 occasions that  
14 when you did experiments that introduced NOX  
15 into your barns, you never introduced the  
16 amount of NOX that corresponds to what you see  
17 in the real world? Did you ever tell anybody  
18 that?

19 MR. GABRIC: Same objection. I

20 --

21 THE WITNESS: When I went  
22 through the paper, I would have -- they would  
23 have seen -- the presentation, they would have  
24 seen table 1; and then on the rest of the  
25 presentation, it would have been talking about

1 adding one pounds to four pounds.

2 BY MR. MC MILLAN:

3 Q. Right, which is not a real-world  
4 amount, is it?

5 A. It's the amount we chose to add.

6 Q. Right. It is higher than the  
7 real-world amount; right?

8 A. It's the amount we chose to add.

9 Q. You consciously made a decision to  
10 introduce a higher amount than you'd find in  
11 the real world; right?

12 A. I consciously added an amount that  
13 we believed would give us a response.

14 Q. Well, let me show you what's  
15 marked as Exhibit 316.

16 Would you read into the record  
17 that top paragraph.

18 MR. GABRIC: Hold on, David.

19 BY MR. MC MILLAN:

20 Q. Can you read into the record that  
21 top paragraph, Dr. Peele?

22 MR. GABRIC: Okay, I'm with  
23 you.

24 THE WITNESS: "In 1998 we  
25 modified two of our eight rack of tobacco barns

1 to burn propane gas (75,000 Btu's per hour).  
2 All tests were comparisons of propane versus  
3 electric. On published emissions data for  
4 combustion and propane, we calculated that the  
5 tobacco was exposed to approximately one pound  
6 of NOX during the entire 160-hour cure. We  
7 elected to expose the tobacco to a higher  
8 concentration" --

9 THE REPORTER: We elected to?

10 THE WITNESS: "We elected to  
11 expose the tobacco to a higher concentration."

12 BY MR. MC MILLAN:

13 Q. Let's just stop right there. Is  
14 that an accurate statement?

15 A. Yes, that's an accurate statement.  
16 We elected to expose the tobacco to a higher  
17 concentration.

18 Q. Is this a document you prepared?

19 A. I cannot tell from this whether I  
20 did because it was done on computer.

21 Q. Okay. In any of the 25 or 30  
22 times that you gave this presentation, Dr.  
23 Peele, did you ever tell anyone in -- in the  
24 public or in your audience that whereas  
25 direct-fired cures generally result in higher

1 NNK values, your experiment resulted in just  
2 the opposite?

3 MR. GABRIC: Object to the form  
4 of the question.

5 THE WITNESS: In all the  
6 presentations we've made, we only talked about  
7 total tobacco-specific nitrosamines.

8 THE REPORTER: Sorry, total?

9 THE WITNESS: Total specific --  
10 total tobacco-specific nitrosamines.

11 BY MR. MC MILLAN:

12 Q. All right. And in any of the  
13 experiments -- in any of the 25 or 30  
14 occasions, did you report on some of the tests  
15 in which, instead of the results that you  
16 reported in your paper, you got TSNA values for  
17 your control barns of 2.3 TSNAs or 3.1 TSNAs  
18 or 2 TSNAs or 3.2 TSNAs? Did you ever report  
19 that data to anyone?

20 A. Just say that one more time.

21 Q. Did you ever report to anyone that  
22 in one of your NOX tests, your TSNA data  
23 ranged between 2 and 3.2 parts per million?

24 MR. GABRIC: Object to the form  
25 of the question.



1 THE WITNESS: We presented the  
2 data that was in the presentation.

3 BY MR. MC MILLAN:

4 Q. And it -- but the data I just  
5 referred to was excluded from the presentation,  
6 wasn't it?

7 A. Well, the data you -- which -- I  
8 don't know which experiment you're talking  
9 about.

10 Q. I'm talking about the NOX test 2.

11 A. We never reported NOX test 2 in  
12 the data that we prepared, as best I can tell  
13 from the data that's in front of me.

14 Q. Okay. Well, in -- in view of the  
15 fact that you conducted tests which in your  
16 control barns had TSNA results that ranged all  
17 the way from non-detect at 3.2, and in view of  
18 the fact that you had these strange NNN  
19 results, did you ever consider that you perhaps  
20 ought to go out and do some further tests --

21 MR. GABRIC: Object to form.

22 BY MR. MC MILLAN:

23 Q. -- to evaluate whether this NOX  
24 theory was really a correct theory or was just  
25 really another mistake?

1 MR. GABRIC: Object to the form  
2 of the question, argumentative, compound.

3 THE WITNESS: Rephrase your  
4 question, please.

5 BY MR. MC MILLAN:

6 Q. Given the fact that your NNN data  
7 was so out of line, that some of your test  
8 results were so out of line, did you ever  
9 think that it would be appropriate scientific  
10 behavior to do some additional tests to  
11 determine whether your NOX theory was correct  
12 or, like some of the other theories, incorrect?

13 MR. GABRIC: Same objection;  
14 argumentative, mischaracterizes the record,  
15 compound. There's a whole bunch of other  
16 things wrong with it, but I can stop there.

17 If you understand the question

18 --

19 THE WITNESS: I don't  
20 understand the question.

21 BY MR. MC MILLAN:

22 Q. What don't you understand about  
23 it?

24 MR. GABRIC: Objection;  
25 argumentative.

1 THE WITNESS: Break it down in  
2 specific questions without asking --

3 BY MR. MC MILLAN:

4 Q. Okay.

5 A. -- two or three questions at a  
6 one time.

7 Q. You're a scientist; right?

8 A. Yes.

9 Q. And -- and as a scientist, you  
10 try to do tests that conform to the real world  
11 as much as possible; right?

12 MR. GABRIC: Objection; vague.

13 THE WITNESS: You don't have --  
14 if you're a scientist, you don't have to  
15 perform tests that conform to real-world  
16 conditions.

17 BY MR. MC MILLAN:

18 Q. And as a scientist, when you see  
19 inconsistencies or data results that look  
20 strange to you, you're supposed to follow up  
21 and do some additional tests, aren't you?

22 A. We did a series of tests all  
23 during 1998.

24 Q. Right. And your series of tests  
25 showed that your electric control barns were

1 all over the lot?

2 MR. GABRIC: Object to form.

3 BY MR. MC MILLAN:

4 Q. Right?

5 MR. GABRIC: Object to the form  
6 of the question.

7 THE WITNESS: Define "all over  
8 the lot."

9 BY MR. MC MILLAN:

10 Q. Zero or non-detect at the bottom  
11 and 3.2 at the top. Would you think of that  
12 as all over the lot?

13 A. At our understanding of TSNA  
14 formation at that particular time, that was  
15 well within what we believed our objective was  
16 to have a 90 percent reduction in TSNA  
17 formation.

18 THE VIDEOGRAPHER: Mr.  
19 McMillan, I'm about to run out of videotape.

20 MR. MC MILLAN: Okay. We'll

21 --

22 THE VIDEOGRAPHER: End of  
23 videotape No. 4, off the record at 5:33.

24 (Recess taken from 5:33 to  
25 5:55.)

1 (Peele Exhibits Nos. 320 to  
2 330 were marked for  
3 identification November  
4 14, 2002.)

5 THE VIDEOGRAPHER: Beginning of  
6 videotape No. 5, back on the record at 5:55.

7 BY MR. MC MILLAN:

8 Q. Dr. Peele, are you familiar with  
9 the design of what I'll call the old  
10 barrel-style heat exchangers?

11 A. No, sir, not by that terminology.

12 Q. What -- what terminology do you  
13 use?

14 A. I don't know what fuel source a  
15 barrel-size heat exchanger is, so I don't --

16 Q. The old diesel heat exchangers.

17 A. Familiar in the fact that I have  
18 seen them because I've seen, you know, the  
19 diesel fuel leaking on the bottom. I've never  
20 examined one until we started the barn  
21 conversion process.

22 Q. Okay. But -- but you've -- as  
23 you sit here today, you've examined them?

24 A. As part of the barn-burning  
25 process, I saw some diesel ones that had been

1 taken out.

2 Q. Right.

3 A. And were sitting in the woods.

4 Q. And generally speaking, the  
5 designs of those diesel-fired heat exchangers  
6 was considerably different from the designs of  
7 any the heat exchangers that have been  
8 installed in retrofitted barns; correct?

9 MR. GABRIC: Object to the form  
10 of the question, vague.

11 THE WITNESS: I don't recall  
12 the specifics of the -- of the internals of  
13 the direct fire. I remember seeing the outside  
14 of the thing sitting in the woods.

15 BY MR. MC MILLAN:

16 Q. So as you sit here today, you're  
17 saying you don't -- you're -- you're not able  
18 to compare, make any comparison, between the  
19 performance of the new retrofitted heat  
20 exchange designs versus the old diesel-fired  
21 heat exchange designs?

22 A. Performance as defined as?

23 Q. Anything.

24 MR. GABRIC: Object to the form  
25 of the question.

1 BY MR. MC MILLAN:

2 Q. Have you ever attempted to make a  
3 -- a comparison between the way an old  
4 barrel-style, barrel by -- I'm just talking  
5 shape of the drum; it's a drum inside. Is  
6 that what you've seen in these diesel-fired  
7 units?

8 A. From the outside, it appeared to  
9 be a drum.

10 Q. Okay. Well, I'm -- I'm referring  
11 to that drum as a barrel.

12 A. All right.

13 Q. Okay? Have you ever made an  
14 effort to compare the performance of one of  
15 those barrel-styled heat exchangers with one of  
16 the new heat exchangers?

17 A. There were samples collected in  
18 1998 from, quote, diesel barns; but at that  
19 time I did not know what the configuration of  
20 the heat exchanger was.

21 Q. Okay. Well, have you ever  
22 attempted to make any comparisons, for example,  
23 of the effect on airflow of using one of the  
24 old designs versus one of the new designs?

25 A. Again, you're referring to the

1 barrel?

2 Q. Yes.

3 A. Airflow of the barrel versus -- in  
4 what time frame?

5 Q. Any time frame.

6 A. Airflows were measured, and I  
7 would have seen some data, but I didn't conduct  
8 the experiments -- or I didn't conduct the  
9 measurements.

10 Q. Airflow was measured in what?  
11 What are you talking about?

12 A. The velocity of air through an  
13 orifice.

14 Q. You're saying that Reynolds has  
15 conducted some tests of the old barrel-style  
16 designs and tried to compare them with the new  
17 designs from an airflow perspective?

18 A. Again, I can't tell you if it was  
19 the old barrel type or not.

20 Q. So as you sit here today, you're  
21 not able to tell me what the --

22 A. I couldn't tell you any of the  
23 data because I wouldn't -- I don't recall any  
24 of that, and I don't recall the specifics of  
25 the -- of the -- of the test.



1 Q. Okay. Well, you do know from an  
2 engineering perspective or you would expect  
3 from an engineering perspective that the new  
4 designs would deliver greater airflow than the  
5 old barrel-type designs, all other things being  
6 equal?

7 MR. GABRIC: Object to the form  
8 of the question, vague, lack of foundation.

9 THE WITNESS: Repeat it for me  
10 --

11 MR. MC MILLAN: Do you know --

12 THE WITNESS: -- or rephrase  
13 it.

14 BY MR. MC MILLAN:

15 Q. Do you not know, Dr. Peele, that  
16 the new designs, just from an engineering  
17 standpoint, are designed to deliver greater  
18 airflow than the old barrel designs --

19 MR. GABRIC: Object.

20 BY MR. MC MILLAN:

21 Q. -- all other things being equal?

22 MR. GABRIC: Objection; lack of  
23 foundation, vague, compound.

24 THE WITNESS: And I don't know.

25 BY MR. MC MILLAN:

1 Q. Well, the fact of the matter is  
2 you specifically set out to find a design that  
3 would deliver more airflow; right?

4 MR. GABRIC: Objection; form of  
5 the question, it's vague.

6 THE WITNESS: It is my belief  
7 that we set out to find a -- if you use the  
8 term airflow as what a fan with a certain size  
9 horsepower on a fan performance curve will  
10 deliver that will be comparable to what is  
11 normally in the tobacco barn.

12 BY MR. MC MILLAN:

13 Q. Yes. But there are different  
14 resistances that a fan confronts in a tobacco  
15 barn; correct?

16 A. That's correct.

17 Q. And the resistance that one of  
18 these old barrel designs presents is quite a  
19 bit different from the resistance that one of  
20 these new designs presents; correct?

21 MR. GABRIC: Object to the form  
22 of the question, lack of foundation.

23 THE WITNESS: I don't know  
24 that.

25 BY MR. MC MILLAN:

1 Q. You don't know that, okay.

2 Well, is it true that there  
3 came a time, Dr. Peele, when you decided you  
4 needed to conduct an in-house engineering  
5 evaluation to see whether Reynolds could come  
6 up with a better heat exchange design than  
7 existed in the art?

8 A. I did not come up with that.  
9 There were engineers within RJR who believed  
10 that they could do that, but it was not me.

11 Q. Right. But the reason those  
12 engineers came up with that was because you  
13 asked them to come up with that; right?

14 A. No. When it was -- when we  
15 discussed it in Winston-Salem, there were other  
16 people involved in the process who wanted to  
17 see whether or not Reynolds could make a heat  
18 exchanger.

19 Q. Right. And the reason they wanted  
20 to make a heat exchanger was so that they  
21 could get a heat exchanger that had higher  
22 performance in terms of things such as better  
23 airflow?

24 MR. GABRIC: Object to the  
25 form.

1 BY MR. MC MILLAN:

2 Q. Right?

3 MR. GABRIC: Object to the form  
4 of the question, vague, compound, lack of  
5 foundation.

6 THE WITNESS: Rephrase it,  
7 please.

8 BY MR. MC MILLAN:

9 Q. Who were these people? Let's put  
10 some names to them.

11 A. I don't specifically recall the  
12 names of the engineers who were given the task  
13 of -- of looking at that.

14 Q. Who gave them the task?

15 A. Someone other than me because it  
16 wasn't me.

17 Q. So you don't know who did it --

18 A. I don't know who did it.

19 Q. -- who gave them the task, all  
20 you know is that they reported back to you on  
21 their results?

22 A. That's correct.

23 Q. And -- and they were asked to  
24 come up with a heat exchanger that would  
25 deliver 18,000 cubic feet per minute of air;

1 right?

2 A. I don't recall that number.

3 Q. Well, do you recall sitting down  
4 in conversations with these people, whose names  
5 you can't remember, and saying in words or  
6 substance, you know, "Look, these old barrel  
7 designs, I don't think they're up to the task"?

8 MR. GABRIC: Object to the form  
9 of the question, vague, assumes facts not --

10 BY MR. MC MILLAN:

11 Q. Do you remember any discussion  
12 like that?

13 MR. GABRIC: Same objection,  
14 assumes facts not in evidence.

15 THE WITNESS: I don't recall  
16 any conversations like that.

17 BY MR. MC MILLAN:

18 Q. Do you ever recall proposing some  
19 barn design to Swedish Match?

20 A. May I see the document?

21 Q. Sure. Exhibit 320, the memo from  
22 you to Dwayne Beeson of March 29, 2001.

23 A. The topic of conversation that  
24 this memo refers to is trying to mimic or  
25 simulate air curing in a flue-cured barn on

1 burly tobacco.

2 Q. Okay. Let me show you -- let's  
3 see here. We need one other -- well, we will  
4 just keep it this way, I guess.

5 I'm going to give you a series  
6 of documents here, Dr. Peele. They all involve  
7 Mr. -- well, except the last one. The first  
8 four involve someone named David Newsome.

9 Is he the person that you  
10 interfaced with on the new heat exchanger  
11 design?

12 A. David Newsome? May I see the  
13 documents?

14 Q. Sure. Exhibit 321, now this may  
15 be two different documents. The first is an  
16 e-mail from you to Mr. Newsome of November 24,  
17 '98. The second is something that was sent to  
18 you on November 24th, '98.

19  
20 322 is a memorandum of December  
21 8th, '98, directed from Mr. Newsome to Mr.  
22 Flinchum.

23 Exhibit 323 is December 8th,  
24 '98, from Mr. -- see if that's the same one --  
25 is that the same one that I'm marking twice?

1 No. I think I just -- 323, that is.

2 And 324 is December 8th from  
3 Newsome to Flinchum.

4 325 is December 7th from Peele  
5 to various people.

6 MR. GABRIC: May I have copies?

7 MR. MC MILLAN: Yeah.

8 MR. GABRIC: Thank you.

9 BY MR. MC MILLAN:

10 Q. Let's start with the first one,  
11 the Peele to Newsome. Do you have that one in  
12 front of you?

13 A. Is that Exhibit 321?

14 Q. 321.

15 "David," you say, "Glad you  
16 agreed that 18,000 CFM looks impossible on this  
17 fan curve." Going down a little further,  
18 there's something that says, "Using his number  
19 about" 3 -- 11 -- "about 11,000 CFM is  
20 required."

21 Does this refresh your  
22 recollection that there came a point in time,  
23 Dr. Peele, when you tried to evaluate what  
24 might be needed in the real world in terms of  
25 heat exchange design?

1           A.     I see the documents, but I -- I  
2     can't back-calculate where the 18,000 CFM comes  
3     from.

4           Q.     Is there someone within Reynolds  
5     that either works with you or that you know of  
6     that you believe is an expert in heat exchange  
7     designs?

8           A.     No, sir.

9           Q.     Do you know of anyone within  
10    Reynolds who has attempted to make an effort to  
11    compare the respects in which the new heat  
12    exchanger designs exceed earlier versions?

13          A.     Exceed the earlier versions in  
14    what respect?

15          Q.     Well, for instance, in the ability  
16    to deliver air or deliver heat.

17          A.     Anyone within Reynolds?

18          Q.     Yes.

19          A.     And for -- if you will repeat the  
20    question just one more time or have the  
21    recorder repeat the question so I know what  
22    you're asking.

23          Q.     Okay. My question is this: I'm  
24    going to change the question on you. That's a  
25    trick of the lawyers.



1 MR. GABRIC: Seen that a few  
2 times today.

3 BY MR. MC MILLAN:

4 Q. If we come to trial in this case  
5 and put on evidence that says, you know, these  
6 new heat exchangers, they're quite a bit  
7 different from what existed, they're designed  
8 to operate quite a bit differently, do you have  
9 the expertise and knowledge to respond to that?

10 MR. GABRIC: Object to the form  
11 of the question, calls for speculation. The  
12 question is vague, ambiguous, compound.

13 And I will note for the record  
14 that this is the last question. The deposition  
15 has exceeded seven hours.

16 THE WITNESS: And my answer is  
17 I don't know.

18 BY MR. MC MILLAN:

19 Q. And why is it that you don't  
20 know?

21 MR. GABRIC: We're -- we're  
22 done. This deposition is over, Mr. McMillan.  
23 We have gone past the seven hours, and I've  
24 been kicked out of depositions for going past  
25 seven hours, so we're done.

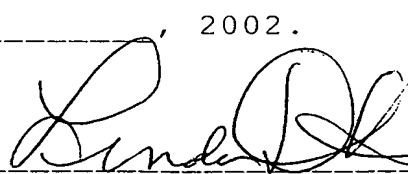
1 STATE OF ILLINOIS )  
 ) SS.  
2 COUNTY OF DE KALB )

3 I, Linda D. Hansen, CSR, RDR, CRR, a  
4 notary public in and for the County of DeKalb and  
5 State of Illinois, do hereby certify that the  
6 witness was by me first duly sworn to testify to  
7 the truth, the whole truth, and nothing but the  
8 truth, and that the preceding deposition was  
9 recorded stenographically by me and reduced to  
10 typewriting by computer transcription.

11 I FURTHER CERTIFY that the foregoing  
12 transcript is a true and correct transcript of the  
13 testimony given by the said witness at the time and  
14 place specified hereinbefore.

15 I FURTHER CERTIFY that I am not a  
16 relative or employee or attorney or counsel of any  
17 of the parties, nor a relative or employee of such  
18 attorney or counsel, nor financially interested  
19 directly or indirectly in this action.

20 IN WITNESS WHEREOF, I have hereunto set  
21 my hand and affixed my notarial seal this \_\_\_\_\_  
22 day of \_\_\_\_\_, 2002.

23   
24 \_\_\_\_\_  
25 Linda D. Hansen, C.S.R. No. 84-3027

OFFICIAL SEAL  
LINDA D. HANSEN  
NOTARY PUBLIC - STATE OF ILLINOIS  
MY COMMISSION EXPIRES JAN. 22, 2002

1 STAR SCIENTIFIC, INC.,

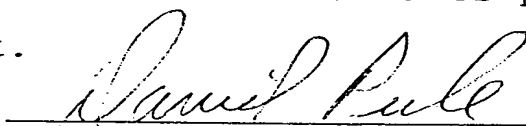
2 Plaintiff,

3 vs.

4 R.J. REYNOLDS TOBACCO COMPANY,

5 Defendant.

6 I, DAVID PEELE, hereby certify  
7 that I have read the foregoing transcript of my  
8 deposition taken on Thursday, November 14,  
9 2002, consisting of pages 1 to 267, and that  
10 to the best of my knowledge it is a true and  
11 correct transcript of said deposition, except  
12 as I have changed it on the attached sheets in  
13 accordance with the rules provided by the said  
14 court.

15 

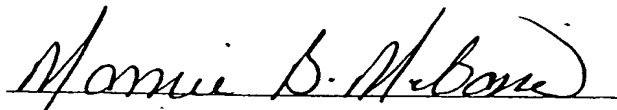
16 DAVID PEELE

17  
18 No errata sheets submitted (Please initial) \_\_\_\_\_

19 Number of errata sheets submitted 1 (pgs.)

20  
21 SUBSCRIBED AND SWORN TO

22 before me this 31 day of December, 2002.

23  
24 

25 Notary Public

6/24/2003

**ERRATA SHEET**

**N RE: STAR SCIENTIFIC, INC. vs. R.J. REYNOLDS TOBACCO COMPANY, CASE NO. AW01-CV1504 AND AW 02 CV 2504**  
**DEPOSITION OF: David Peele**

**DATE OF DEPOSITION: November 14, 2002**

**At the time the above named deponent and signed this disposition, the deponent desired to make the following changes:**

<b><u>PAGE</u></b>	<b><u>LINE</u></b>	<b><u>AS TRANSCRIBED</u></b>	<b><u>CHANGED TO</u></b>	<b><u>REASON FOR CHANGES</u></b>
7	11	total	toll	wrong word
11	9	of what has turned into trade yellowing	of what is termed in the trade yellowing	inadvertently transcribed
33	22	are and what -- what the date it was in order	are and what the data is in order	inadvertently transcribed
191	9	copy of Exhibit 296 was not in documents I received		
217	13	Ari	Ira	inadvertently transcribed
220	3	red	rack	wrong word
233	19	26 is a four-rack electric barn	26 is a sixteen rack electric barn	wrong word

**Clarification Issues**

217	5,6	tobacco in one electric barn, two propane barns, two direct-fired that we'd converted	tobacco in one electric barn, two direct-fired propane barns that were converted from electric barns
236	12-14		Grab samples from NOX Test 1
238	23	in the cylinder, it was pure NO	in the cylinder, it was 99.5% NO

1                   IN THE UNITED STATES DISTRICT COURT  
2                   FOR THE DISTRICT OF MARYLAND  
3                   SOUTHERN DIVISION  
4                   CASE NO. AW 01-CV-1504  
5                   CASE NO. AW 02-CV-2504  
6

7 -----X  
8   STAR SCIENTIFIC, INC.,   :  
9                   Plaintiff,   :  
10               Vs.               :  
11   R.J. REYNOLDS TOBACCO   :  
12   COMPANY,                :  
13                   Defendant.   :  
14 -----X

**ORIGINAL**

15  
16  
17  
18                   Deposition of TIM NESTOR  
19                   (Taken by the Plaintiff)  
20                   Chicago, Illinois  
21                   August 29th, 2002  
22  
23  
24

25   Reported by:   Susan Babicki, CSR No. 084-003956

1 others did in connection with this comparison of  
2 domestic versus overseas.

3 A. Basically my role would have been to  
4 determine what tobaccos that I would want to test,  
5 determine what tobaccos were available, and obtain  
6 those tobaccos from our inventories, submit them  
7 for whatever chemical and/or smoke analysis that I  
8 may want and then submit them to the lab for those  
9 analyses.

10 Q. Okay. Let's go forward in time then to  
11 the 1998 time frame.

12 What activities were you involved in  
13 relating to TSNA in 1998?

14 A. In '98, particularly late in '98, my  
15 direct role probably increased more as I was  
16 responsible for the gathering of a number of  
17 samples in which we were trying to look at the  
18 differences between direct fire and heat exchange  
19 tobaccos that were flue-cured tobaccos.

20 Q. Was that the primary TSNA activity you  
21 had in 1998 that you were involved in?

22 A. I was involved in some of the other  
23 experiments in a cursory role, some of the fan  
24 cycling, packing density experiments, the CO2  
25 measurements and things of that nature.

1 responsible for the daily activity in terms of the  
2 experiments, and Dr. Peele would have been  
3 basically overseeing those experiments.

4 Q. In 1998 or for that matter for the  
5 years leading up to '98, Mr. Nestor, did you ever  
6 reach a personal conclusion as to what causes the  
7 formation of TSNAs in flue-cured tobacco?

8 A. I had read in the literature about what  
9 the hypothesis for nitrosamine formation was, and I  
10 had no other reason to believe there was anything  
11 else besides that at the time.

12 Q. When did you first learn or when were  
13 you first told there might well be something or  
14 somebody believed there might well be something  
15 other than that hypothesis at work?

16 A. When Dr. Peele brought it to other  
17 people's attention, to my attention that he may --  
18 he thought he might have come across something.

19 Q. Was that in either May or June of 1998?

20 A. I'm not exactly sure of the time frame.

21 Q. Was it in 1998 sometime?

22 A. I believe so.

23 Q. Okay. Now, let's go forward in time  
24 again, and then we'll come back and get into a  
25 little more detail.

1 But in 1999 what role did you have in  
2 TSNA research?

3 A. I was involved in the pilot program in  
4 which we were trying to demonstrate the commercial  
5 feasibility to converting direct fire barns to heat  
6 exchangers.

7 My role involved the data analysis and  
8 compiling that data so that comparisons could be  
9 made.

10 Q. You also had a role in coordination of  
11 the fire barn activities, did you not?

12 A. I was aware of the farm activities, but  
13 I really didn't have any coordination role in that  
14 regard. That primarily fell within the Avoca  
15 personnel.

16 MR. McMILLAN: Let's mark this as  
17 Exhibit 209.

18 (Nestor Exhibit No. 209 was  
19 marked for identification.)

20 BY MR. McMILLAN:

21 Q. Mr. Nestor, I'm showing you a copy of  
22 an E-mail from Jeff Gentry dated March 29th, 2000.  
23 It's addressed to David Doolittle.

24 Who is David Doolittle?

25 MS. VITELLARO: Objection. I think



1 chemistry collection, and coordination with your  
2 staff."

3 Does that refresh your recollection  
4 that you had some responsibility for, quote, all  
5 farm coordination?

6 A. The farm coordination that's referenced  
7 here refers to the coordination of obtaining  
8 tobaccos from those farms to be brought to Winston  
9 Salem so that we could conduct our analysis.

10 Q. So you did have a responsibility for  
11 that?

12 A. For that particular aspect, yes.

13 Q. What other involvement did you have in  
14 1999 other than the pilot project, anything?

15 A. I also conducted some NOX experiments  
16 during the '99 time frame.

17 Q. When you say you conducted the NOX  
18 experiments, what do you mean?

19 A. I looked at different alkaloids and  
20 their interactions with NOX in a nontobacco medium.

21 Q. When you say you looked at it, do you  
22 mean you personally?

23 A. Correct.

24 Q. So you were actually the technician, so  
25 to speak?

1           A.     I was hands on, if that's what you  
2     mean.

3           Q.     Right. Now, do you have a chemistry  
4     background?

5           A.     No, I do not.

6           Q.     These were primarily chemical or  
7     chemist-type tests, though, weren't they?

8           A.     They're scientific tests.

9           Q.     What background or experience did you  
10    have that qualified you for doing these sorts of  
11    tests?

12          A.     Again, I have a scientific background,  
13    and I am aware of scientific procedures.

14          Q.     Exactly what NOX test did you conduct?

15          A.     Again, taking a nontobacco medium and  
16    looking at what occurred when you exposed various  
17    tobacco alkaloids to NOX gas.

18          Q.     So in 1999 then, you were responsible  
19    for the coordination of the pilot program and you  
20    were also involved in doing some NOX testing.

21                 Anything else related to TSNAs?

22          A.     Not that I can remember.

23          Q.     Well, let's bring ourselves up-to-date.

24                 In the 2000-2001 and 2002 time frame,  
25    what responsibilities have you had in this area?

1 Q. And who is the head of the brands  
2 department?

3 A. Skip Tinsley is the head of brands.

4 Q. Skip Tinsley?

5 A. Correct.

6 Q. Who does he report to?

7 A. Dave Townsend.

8 Q. Mr. Nestor, let me show you a copy of  
9 the article that was, I believe, published for the  
10 first time in approximately September of 1999.

11 It was previously marked as Gentry  
12 Deposition Exhibit 30(b)6 No. 67, and it's  
13 entitled, "Formation of tobacco specific  
14 nitrosamines in flue-cured tobacco."

15 Are you familiar with this article?

16 A. Yes.

17 Q. You're listed as a coauthor of the  
18 article; is that right?

19 A. Correct.

20 Q. What -- can you tell me what was your  
21 contribution to this article?

22 And if you can, point out to me the  
23 specific paragraphs or charts or whatever that you  
24 were actively involved in or had some  
25 responsibility for?

1 MS. VITELLARO: I'm going to object as  
2 vague.

3 BY MR. McMILLAN:

4 Q. That's just an objection for the  
5 record. Go ahead.

6 A. Could you be more specific?

7 Q. No. I'd like to know what parts of  
8 this article you had some responsibility for.

9 A. My role in putting together this  
10 article were, one, as a reviewer and then,  
11 secondly, as I basically took the text and created  
12 the graphs and embedded the graphs within the --  
13 and tables within the document.

14 Q. Okay. Now, some of these graphs and  
15 tables contained information that you would have  
16 been responsible for developing; is that right?

17 A. That I was either provided or had  
18 generated from raw data that had been provided to  
19 me.

20 Q. And which of these charts or graphs  
21 were you responsible for developing?

22 A. I put all of the tables and charts  
23 together for embedding into the manuscript.

24 Q. All right. And let's start with  
25 table 3, Mr. Nestor.

1                   Where did you develop the data that was  
2 put into table 3? Sorry. It's on the second to  
3 last page or third to last page. Sorry.

4           A.     Table 3 labeled as the, "TSNA sampling  
5 from the various commercial producing barns"?

6           Q.     Right.

7           A.     That data came from our 1998 sampling.

8           Q.     What 1998 sampling are you talking  
9 about?

10          A.     In which flue-cured tobaccos were  
11 sampled from various heat exchange and direct fire  
12 barns.

13          Q.     How did you go about selecting the heat  
14 exchange barns that you were going to sample in  
15 1998?

16                   MS. VITELLARO: Objection, foundation.

17                   THE WITNESS: Could you repeat the  
18 question?

19                   BY MR. McMILLAN:

20          Q.     How did you go about selecting the heat  
21 exchange barns that you were going to sample in  
22 1998?

23          A.     They were just a random selection.

24          Q.     And why did you do that on a random  
25 basis?

1           A.     Again, the main criteria was heat  
2 exchange versus direct fire.

3           Q.     Okay. Were you trying to get some sort  
4 of a representative group of heat exchange samples  
5 so that you could compare it to direct fire?

6           A.     I don't understand your question.

7           Q.     What about my question do you not  
8 understand?

9           A.     What do you mean by "a representative  
10 sample of heat exchange samples"?

11          Q.     I mean, did you attempt to obtain  
12 samples from heat exchanges that you thought would  
13 be reasonably representative of what you'd likely  
14 find out there in the world in sampling heat  
15 exchangers for TSNAs?

16          A.     We attempted to find as many different  
17 types of heat exchangers as we could during the  
18 time frame that we were doing this study.

19          Q.     Now, let me see if I can -- there's a  
20 reference in table 3 to the fact that there were  
21 27 samples for bulk diesel.

22                   Do you see that?

23          A.     Yes.

24          Q.     And then there were also 23 samples  
25 obtained from Turkey; is that right?

1 A. Correct.

2 Q. Now, is the Turkey -- were the samples  
3 obtained from Turkey, was that obtained in the '97  
4 time frame or was that in '98 also?

5 A. I'm not sure when those would have been  
6 obtained.

7 MR. McMILLAN: Just give me one minute  
8 here, please. Let me mark these as 210 and 211,  
9 please.

10 (Nestor Exhibit Nos. 210-212  
11 were marked for identification.)

12 MS. VITELLARO: Is this 210?

13 MR. McMILLAN: That's 210. This is  
14 211. This is 212.

15 BY MR. McMILLAN:

16 Q. Mr. Nestor, I'm going to show you four  
17 documents here just to speed this along a little  
18 bit.

19 Let me identify them for the record,  
20 and then I'll pass them over to you. Now, the  
21 first Exhibit 210 is -- has two E-mails up at the  
22 top. One is from David Peele to you and others  
23 dated March 24th, '99, and the original message is  
24 from you to Dr. Gentry, Dr. Peele, and Gary Shelar.

25 A. Shelar.

1 Q. Shelar. Exhibit 211 is something  
2 entitled, "Nitrosamine summary." Exhibit 212 are  
3 some answers to an interrogatory that R.J. Reynolds  
4 provided to us in this lawsuit.

5 And exhibit -- the last exhibit is  
6 previously marked as Exhibit 190 in the Brown  
7 deposition. I'll pass those over to you.

8 MS. VITELLARO: Is there another copy  
9 of 190?

10 MR. McMILLAN: Yes. Sorry.

11 BY MR. McMILLAN:

12 Q. First of all, just to get sort of  
13 coordinated here, Exhibit 210 makes reference to an  
14 attached file that's a compilation of our  
15 nitrosamine data.

16 It says, "I have listed typical TSNA  
17 ranges by tobacco type and also listed expanded  
18 range which is meant to illustrate other possible  
19 measurements."

20 Do you remember that E-mail?

21 A. I'd have to see the E-mail, the  
22 attachment maybe to know.

23 Q. Okay. Well, look at Exhibit 211. Tell  
24 me whether that is either the attachment or has the  
25 same data that you recalled would have been in the



1 attachment to your E-mail.

2 A. I believe it is, yes.

3 Q. Now, in the attachment 211, which is  
4 entitled "Nitrosamine summary," you have a typical  
5 range and an expanded range.

6 Let's -- first of all, tell us what you  
7 meant by those two titles?

8 A. "Typical range" would mean that you  
9 would typically see this sort of result with any of  
10 the various tobacco types listed here.

11 And "expanded range" would be that  
12 occasionally you would see results of this type,  
13 but on a more consistent basis it would fall within  
14 the typical range.

15 Q. What do you mean by "typical"?

16 A. That if you were to go out and conduct  
17 a measurement within our laboratory on this  
18 particular tobacco type that your result would most  
19 likely fall within the typical range.

20 Q. Okay. Now, your typical range for heat  
21 exchange flue-cured is one to two parts per  
22 million; is that right?

23 A. Yes. That's listed here.

24 Q. How did you derive that number?

25 A. I don't remember exactly how that

1 number was obtained.

2 Q. The expanded range for heat exchanged  
3 flue cured is .5 to 2.5 parts per million.

4 Do you remember how you arrived at that  
5 number?

6 MS. VITELLARO: Objection, foundation.

7 THE WITNESS: All of these numbers  
8 would have been arrived based upon data that had  
9 been generated.

10 BY MR. McMILLAN:

11 Q. But you were the person that collected  
12 that data and drew these conclusions, correct?

13 A. Either data that I generated or data  
14 that others would have generated.

15 Q. So in other words, you either took data  
16 you had generated yourself or others had generated  
17 and drew the conclusions reflected here?

18 A. Again, this is for numbers that would  
19 be -- would have been typical or expanded within  
20 our laboratory, yes.

21 Q. And by "within your laboratory," you  
22 mean you got samples from outside in the real world  
23 and measured them in your laboratory?

24 A. The analysis within our laboratory,  
25 correct.

1 Q. Now, in the article that was published  
2 in September of 1999, the table 3 bulk diesel heat  
3 exchange number is one part per million, correct?

4 Go back to that. Sorry. Go back to  
5 table 3 that we were looking at before.

6 A. Okay.

7 Q. And first of all, a bulk diesel heat  
8 exchange, what we're referring to here, I take it,  
9 or what you're referring to is an oil-fired heat  
10 exchanger, barns that are equipped with an  
11 oil-fired heat exchanger?

12 A. In terms of the bulk diesel?

13 Q. Yes.

14 A. That's correct.

15 Q. And the number there is 1.0.

16 Can you tell me what's the  
17 relationship, if any, between the conclusions  
18 stated in this paper that oil-fired heat exchangers  
19 have TSNAs of one part per million and the  
20 conclusion in your Exhibit 211 that heat exchangers  
21 have a typical range of one to two parts per  
22 million?

23 MS. VITELLARO: Objection, foundation.

24 THE WITNESS: The data listed here in  
25 terms of one part per million for the bulk diesels

1 are the average of the 27 samples.

2 BY MR. McMILLAN:

3 Q. Okay. And what is -- how does that  
4 compare with the one to two part per million in the  
5 Exhibit 211?

6 A. Well, the only thing I can say is it  
7 fell within that range.

8 Q. So the one part per million was the  
9 average of 27 samples?

10 A. Correct.

11 Q. And are the 27 samples that were  
12 averaged -- if you'll go now to Exhibit 212.

13 First of all, have you seen Exhibit 212  
14 before? You know, actually I think I  
15 misidentified -- I think the article -- I have to  
16 do a little correction for the record, Mr. Nestor.

17 The article -- your article of  
18 September of '99, I think I said it was Gentry  
19 Deposition Exhibit 67. Well, maybe it was. Well,  
20 maybe it was 67. I thought maybe it was marked as  
21 a different number. Forget all that. Let's go  
22 back -- let me start over.

23 Look at Exhibit 212, please. And 212  
24 is an interrogatory that was asking R.J. Reynolds  
25 to tell us the identity or identify for us the

1 the 27 samples had formed the basis for -- well,  
2 let's -- let me start over.

3 We're referring now to the data that  
4 got incorporated into your article in  
5 September 1999 that included, among other things,  
6 that based on 27 heat exchange samples the TSNA  
7 value, average value for those samples was one part  
8 per million?

9 MS. VITELLARO: Objection, foundation.

10 BY MR. McMILLAN:

11 Q. Right?

12 A. Could you repeat that again?

13 Q. You wrote an article in September of  
14 1999 with others, correct?

15 A. I did not write that article. I  
16 reviewed that article and was a coauthor in that  
17 article.

18 Q. You were a coauthor of an article that  
19 was presented in September of '99, right?

20 A. Correct.

21 Q. And you reviewed that article and you  
22 provided certain input into that article, correct?

23 A. Correct.

24 Q. One of the inputs you provided was a  
25 chart that's labeled table 3, correct?

1 A. I generated a chart, correct.

2 Q. And one of the conclusions of that  
3 chart is that from a field of 27 oil-fired heat  
4 exchange samples that Reynolds took you concluded  
5 that the average TSNA value was one part per  
6 million, correct?

7 A. The 27 diesel heat exchange samples  
8 average was one part per million?

9 Q. Right.

10 A. Correct.

11 Q. Right. And that reflected efforts that  
12 you had made to collect heat exchangers from a --  
13 excuse me -- to collect samples from a variety of  
14 different diesel-fired heat exchange barns and  
15 analyze those samples to determine the TSNA values,  
16 correct?

17 A. Decisions that I had made?

18 Q. Not decisions. Actions that you had  
19 taken.

20 A. As a group. I was involved in a group  
21 activity.

22 Q. Right. So you, as part of this group  
23 activity, were responsible for collecting these  
24 27 samples from a variety of different barns?

25 A. Yes, I was involved in that activity.

1 Q. All right. And you oversaw in some way  
2 the analysis of those samples to determine what the  
3 average TSNA value is for diesel-fired heat  
4 exchange products, correct?

5 A. Well, I provided the samples for  
6 analysis.

7 Q. And you -- did you reach a conclusion,  
8 Mr. Nestor, that the -- that one part per million  
9 was a reasonable value to put into this article?

10 A. The data speaks for itself.

11 Q. So --

12 A. It's --

13 Q. The data is accurate?

14 A. The one part per million listed in  
15 table 4 of this document is reflective of the  
16 27 samples that are also listed in table 4 of this  
17 document.

18 Q. And just so we avoid any confusion,  
19 table 4 of the draft of the article, Exhibit 61, is  
20 based on the same data as table 3 of the final  
21 article? I think we just agreed on that a moment  
22 ago.

23 You're looking at the draft article.  
24 If you'd just pull out the final article. Look at  
25 table 3.

1                   That's the same data, right?

2           A.     Correct.

3           Q.     So let's now go through the different  
4 sample numbers that are listed in the interrogatory  
5 response. Strike -- let me slow down a little bit.

6                   After we received a copy of your  
7 article in this draft and when we were taking --  
8 after we took Dr. Gentry's deposition, are you  
9 aware that we asked Reynolds to specifically  
10 identify for us the 27 oil-fired samples that are  
11 the basis for this article?

12           A.     I was asked to provide some information  
13 to counsel.

14           Q.     Did you understand that was an order to  
15 respond to a question we had asked or an  
16 interrogatory that we had asked?

17           A.     Yes.

18           Q.     So as best you know, the information in  
19 this interrogatory response came from you; is that  
20 right?

21           A.     In this particular part of the  
22 interrogatory?

23           Q.     Yes.

24                   MS. VITELLARO: Objection, foundation.

25                   THE WITNESS: I don't know.



1 BY MR. McMILLAN:

2 Q. Well, there's list of -- the question  
3 that was asked here was: "For each of the 27 heat  
4 exchanger samples reflected in table 4 of Gentry  
5 Deposition Exhibit 61," which is the draft that  
6 you're looking at right there, for each of those  
7 27 diesel heat exchange samples provide certain  
8 information such as the date the sample was  
9 collected, et cetera, okay?

10 A. Okay.

11 Q. All right. The first sample that's  
12 listed is Exhibit 157A. And now I want you to go  
13 to Exhibit 190, which you have right there in front  
14 of you. That's the collection of Reynolds data  
15 that has a little more detail to it than this  
16 interrogatory response.

17 Exhibit 157A appears to refer to a  
18 sample taken from Hassel Brown farm on October 7th,  
19 1998.

20 Was that one of the samples that was  
21 included in the 27?

22 A. It may have been. I don't know this  
23 document well enough to be able to answer that  
24 question.

25 Q. Well, I've gone ahead on my own copy

1 here and highlighted just for myself the different  
2 samples that correspond to the interrogatory  
3 response.

4 And I see under the names -- under the  
5 heading of -- let's see what it's called -- the TOB  
6 source -- does that stand for tobacco source?

7 A. I don't know. I didn't make this.

8 Q. Have you ever seen data like this?

9 A. Have I ever seen data like this?

10 Q. Well, isn't it true, Mr. Nestor, that  
11 if you went into the computer systems, your own  
12 databases at Reynolds, and tried to look up  
13 sample 157, you would get, among other things,  
14 exactly this type of information?

15 MS. VITELLARO: Objection, foundation.

16 THE WITNESS: No, that's not correct.

17 BY MR. McMILLAN:

18 Q. It's not correct. And what sort of  
19 information would you get?

20 A. I don't have the ability to look up  
21 sample 157A.

22 MS. VITELLARO: I'd like to point out  
23 that the response to -- the amended response to an  
24 R.J.R. document with a Bates number, and I'm not  
25 quite sure it's the same as this because this has

1           A.     Seven pages in. Repeat the question,  
2 please.

3           Q.     You see the sample -- in the middle of  
4 the page, there's a series of Hassel Brown samples  
5 starting with sample 238A and going to 240 --  
6 actually -- well, 249A, and nine of those samples  
7 are listed as diesel.

8                     Do you see that?

9           A.     Yes.

10          Q.     Is there a reason that those samples  
11 were not included in the 27?

12          A.     I have no idea how these samples were  
13 utilized.

14          Q.     When it came time to pulling together  
15 the data that was going to actually go into in  
16 article in table 3 and deciding what heat exchange  
17 samples were going to be utilized to come up with  
18 the TSNA number that you were going to put into the  
19 table, first of all, who did that? Was that you?

20          A.     No.

21          Q.     Who did it?

22          A.     I don't know that there would be any  
23 one individual that I would know that did that.

24          Q.     All right. Well, how was it done?

25          A.     Again, I don't know.

1           Q.     Well, how was the data provided to you?  
2     I thought you were the person who was responsible  
3     for going out and getting these samples and having  
4     them analyzed?

5           A.     Again, I provided the samples to the  
6     lab. And then after the lab had been -- had  
7     completed the sample analysis, I took the data.

8           Q.     But you chose to create a certain table  
9     out of the data, correct?

10          A.     I chose to do what?

11          Q.     Create a table out of the data.

12          A.     I just reported the data.

13          Q.     Well, you put together the table 3  
14     that's in your article, right?

15                     Didn't we talk about that earlier?

16          A.     I generated on the computer table 3  
17     that was put together.

18          Q.     Right. And where did you get the data  
19     that you used for that?

20          A.     That data would have been generated at  
21     our lab.

22          Q.     But who decided what data to use in the  
23     table that you put together?

24          A.     I don't know specifically who would  
25     have decided that.

1 Q. Well, who might have decided it?

2 A. I would have to speculate.

3 Q. Okay. What's your speculation?

4 A. It would have been someone involved in  
5 the project.

6 Q. So you're saying here, Mr. Nestor, that  
7 in this table that you put together for your  
8 article in which has been published and republished  
9 numerous times that you don't have any knowledge as  
10 to what person put this data together?

11 A. No. What I'm telling you is I know  
12 that there was a -- samples that were collected  
13 that went into this table.

14 Q. Right.

15 A. And those specific samples, that data  
16 is reported in this table.

17 Q. Right. But it was your responsibility  
18 to go out as part of a group and collect the  
19 samples, right?

20 A. Correct.

21 Q. It was your responsibility to go make  
22 sure they got analyzed, right?

23 A. Correct.

24 Q. It was your responsibility to take  
25 those analyses and put them into the table, right?

1           A.     A summary of just combined the  
2 analysis?

3           Q.     Right.

4           A.     Correct.

5           Q.     Did anyone else have any significant  
6 input in generating the table that's shown as  
7 Exhibit 3 in your article?

8           A.     Well, the table was just generated by  
9 the numbers that were provided from the lab.

10          Q.     And did anybody have any -- anyone  
11 other than you have any significant role in  
12 deciding which numbers from the lab to use for  
13 purposes of generating the table?

14          A.     Again, all numbers for the samples that  
15 were provided within the study were utilized, to my  
16 knowledge.

17          Q.     Do you remember some of the different  
18 types of heat exchangers that were analyzed as part  
19 of these 27 samples?

20          A.     Uh-huh.

21          Q.     How many different types of heat  
22 exchangers were there?

23          A.     Oh, I'm not sure exactly how many.

24          Q.     Approximately.

25          A.     To my knowledge, there would have been

1 three different fuel sources that were evaluated in  
2 a heat exchanger system.

3 Q. Well, we're talking -- I'm talking  
4 about the diesel or oil-fired heat exchangers  
5 that -- the 27 samples that we've been talking  
6 about.

7 A. Okay.

8 Q. How many different types of diesel or  
9 oil fired heat --

10 A. What do you mean by "types"? They're  
11 all oil or diesel so . . .

12 Q. Were they made by different  
13 manufacturers, for instance?

14 A. Oh, I don't know.

15 Q. Were you aware of any diesel or  
16 oil-fired heat exchanger that was in use in 1998  
17 that was different from the ones you sampled in  
18 that time period, different in design?

19 A. I don't know.

20 Q. Mr. Nestor, let's take a look at  
21 figure 2 in your article. Just put that to one  
22 side.

23 A. Okay.

24 Q. Let's go back to your article. Let's  
25 look at figure 2. Figure 2 is entitled, "Dose

1 effect of NOX gas on TSNA."

2 Do you have that?

3 A. Yes.

4 Q. That's another of the charts that you  
5 generated?

6 A. Correct.

7 Q. And was this also data that you  
8 collected?

9 A. No.

10 Q. Was this data that was taken from some  
11 of the experiments you did?

12 A. This is not data from an experiment  
13 that I conducted.

14 Q. Where did the data for this chart come  
15 from?

16 A. This came from an experiment that was  
17 conducted at Avoca.

18 Q. Did you have any participation in that  
19 particular experiment?

20 A. What do you mean by "participation"?

21 Q. Well, you said earlier that you had  
22 done your own NOX work.

23 How, if at all, was the work you did  
24 related to the data that's set forth in figure 2?

25 A. I didn't have any hands-on involvement



1 with this particular experiment cited in figure 2.

2 Q. Did you have any hands-on involvement  
3 in the discussion of whether or not there was some  
4 dose effect that could be identified?

5 A. I was involved in the results  
6 discussions, if that's what you mean.

7 Q. What does "dose effect" mean?

8 A. "Dose effect" is implied here that for  
9 various amounts of NOX entered into the curing  
10 schedule there was a change in nitrosamine  
11 response.

12 Q. Okay. Did you ever have any  
13 discussions about what sort of dose-response  
14 relationship does or does not exist between NOX and  
15 TSNA?

16 A. I don't follow the question. I'm  
17 sorry.

18 Q. Well, this particular experiment that's  
19 at subject here involved two different -- the use  
20 of two different amounts of NOX gas, right?

21 A. Correct.

22 Q. 1.80 kilograms and .45 kilograms,  
23 right?

24 A. Correct.

25 Q. And then the two lines or graph there

1 show the TSNAs that formed when you introduced  
2 those two different amounts of NOX, correct?

3 A. Correct.

4 Q. Now, are you familiar with terminology  
5 like "a dose-response relationship that's linear,"  
6 would that be --

7 A. Yes.

8 Q. Did you ever have any discussion as to  
9 whether the dose-response relationship between NOX  
10 and TSNAs was linear?

11 A. Yes.

12 Q. What, if any, conclusions were reached?

13 A. I don't know that there were any  
14 conclusions reached.

15 Q. Who participated in the discussions?

16 A. That would have been the working group.

17 Q. Who was the working group?

18 A. That would have been Dr. Gentry and  
19 Mr. Peele and Mr. Riddick that would have been  
20 involved in this experiment.

21 Q. So we've got Dr. Gentry, Dr. Peele,  
22 Mr. Riddick, and I think you said you participated  
23 in these discussions?

24 A. Correct.

25 Q. Were there any others?

1 A. I don't remember.

2 Q. Well, when you and Dr. Gentry and  
3 Dr. Peele and Mr. Riddick got together to discuss  
4 dose-response relationships between NOX and TSNA,  
5 did you have an opinion in that?

6 A. My only opinion is that for the two  
7 doses that were induced into the barns we saw two  
8 different levels of nitrosamines.

9 Q. So you didn't have an opinion as to  
10 whether or not it was linear?

11 A. No.

12 Q. Did anyone have an opinion as to  
13 whether or not it was linear?

14 A. I don't know.

15 Q. Did anyone express an opinion that it  
16 was not linear?

17 A. I don't know that either.

18 Q. Did anybody express an opinion that it  
19 was linear?

20 A. I think -- the discussion was to look  
21 at the shape of the database generated here. It  
22 was discussed, and the main conclusion was that  
23 there was a dose response.

24 Q. In your discussions with Dr. Peele and  
25 Dr. Gentry and Mr. Riddick, were there any

1 discussions about whether either 1.8 kilograms or  
2 .45 kilograms of NOX was a realistic amount of NOX  
3 to simulate a barn?

4 A. What do you mean by "realistic"?

5 Q. I mean, did it in some sensible or  
6 scientific or reasonable fashion simulate what you  
7 might find in the real world?

8 A. Well, the intent of this experiment was  
9 just to determine if there was indeed a response to  
10 NOX exposure and if that response was affected by  
11 the amount of NOX provided in each system.

12 Q. So you were trying to ask that question  
13 inside a laboratory somewhere, not ask it for  
14 purposes of finding out what happens in the real  
15 world of a barn?

16 A. This was in a barn.

17 Q. But it was not a commercial barn?

18 A. They were in research barns, correct.

19 Q. Right. Was an effort ever made to see  
20 what actually happens in a real world commercial  
21 barn?

22 A. What do you mean by "see what happens"?

23 Q. See what impact NOX does or doesn't  
24 have.

25 A. Well, the presence or absence of NOX by

1 the use of a heat exchanger or a direct fire, we  
2 would have been evaluating that as well.

3 Q. Once the work that was reflected in  
4 figure 2 was completed, what was the next NOX  
5 analysis or study that was done?

6 A. I don't know what would have come next.  
7 I don't remember off my head.

8 Q. Did the NOX work that you did precede  
9 the figure 2 work or did it come afterwards?

10 A. Well, as indicated by the figure 2,  
11 that this work was done with 1998 flue-cured  
12 tobacco. The work that I did was conducted in the  
13 summer of '99.

14 Q. The work that you did was conducted in  
15 the summer of '99 during the same time the pilot  
16 program was going on?

17 A. Correct.

18 Q. Okay. What work did you do in '99?

19 A. As I referred to earlier in the  
20 nontobacco medium, just looking at interaction of  
21 alkaloids and NOX gas.

22 Q. Tell us precisely what you did step by  
23 step. Pretend I'm a scientist, which I'm not.

24 A. Well, having worked in the field of  
25 tobacco for 12 years, obviously I'm aware of the

1 various alkaloids that are present in tobaccos.

2 I'm also aware of the scientific  
3 literature that refers to -- that these alkaloids  
4 being precursors for various individual  
5 nitrosamines.

6 Q. Okay.

7 A. So in the summer of '99 I conducted a  
8 study that looked at these individual alkaloids  
9 outside of the tobacco matrix and how they  
10 interacted with NOX in that regard.

11 Q. Okay. What specific alkaloids did you  
12 look at outside of the tobacco matrix?

13 A. Nicotine, nornicotine -- I'm trying to  
14 remember -- and anabasine, I believe.

15 Q. Did someone ask you to do this?

16 A. Yes.

17 Q. Who?

18 A. Dr. Gentry.

19 Q. Did he tell you why he wanted you to do  
20 it?

21 A. Fundamental research.

22 Q. What was your purpose in doing it?

23 A. I was asked to do it by Dr. Gentry.

24 Q. Were you trying to test a particular  
25 hypothesis?

1           A.     We did not have a defined hypothesis  
2 going into the experiments, if that's what you're  
3 asking.

4           Q.     Were you trying to determine a specific  
5 thing?

6           A.     No. We pretty much knew at that time  
7 that -- the role in terms of -- NOX played in  
8 nitrosamine formation.

9                   What we were doing at that point was to  
10 verify in the literature that these individual  
11 alkaloids also reacted as we anticipated.

12          Q.     How did you anticipate they were going  
13 to react?

14          A.     As far as the individual alkaloids of  
15 being precursors for particular nitrosamine  
16 formation.

17          Q.     You anticipated that these particular  
18 alkaloids would be precursors and result in TSNA  
19 formation?

20          A.     Well, the literature is very clear in  
21 that regard. It's the nitrosation of the tobacco  
22 alkaloid.

23          Q.     Were you trying to do anything other  
24 than what the literature already demonstrated?

25          A.     No.

1 Q. Okay. And what conclusions did you  
2 reach?

3 A. That the expected alkaloids did  
4 generate the expected nitrosamine when exposed to  
5 NOX gas.

6 Q. Did you evaluate that at different  
7 levels of NOX gas?

8 A. Yes.

9 Q. And what impact, if any, was there when  
10 you varied the levels?

11 A. I'd have to review that data to tell  
12 you for sure, but -- I can't really speculate on  
13 that, to tell you the truth.

14 Q. Tell us as precisely as you can exactly  
15 what you did.

16 A. We would take a filter pad, which is  
17 generally used to trap tar in general smoke  
18 analysis, and we would treat that pad with a  
19 solution that contained a tobacco alkaloid and then  
20 put this pad into a sealed bag in which you would  
21 be able to inject a known concentration of NOX gas,  
22 knowing the volume of air that you could fill this  
23 bag up and inject a known amount of NOX so that you  
24 had a concentration of NOX in there.

25 And then the pad would be analyzed



1 after a time frame exposure for nitrosamine  
2 content.

3 MR. McMILLAN: Let me take a short  
4 break.

5 THE VIDEOGRAPHER: End of videotape  
6 one. Off the record at 11:41.

7 (Recess.)

8 (Nestor Exhibit Nos. 213-217  
9 were marked for identification.)

10 THE VIDEOGRAPHER: Beginning of  
11 videotape number two. Back on the record at 11:49.

12 BY MR. McMILLAN:

13 Q. Mr. Nestor, I'm going to show you a  
14 series of exhibits. I'll just identify them  
15 briefly for the record.

16 First is Exhibit 213 entitled, "Outline  
17 for TSNA presentation." Next is 214 entitled,  
18 "TSNA mechanism study." Next is 215 which are a  
19 series of notes which, I think, may be your  
20 handwriting, but I'll ask you that in a minute.

21 216 is another set of notes, may or may  
22 not be your handwriting. Exhibit 40 was previously  
23 marked at Mr. Gentry's deposition, and Exhibit 217  
24 is a collection of data. The Bates stamp number is  
25 525755893.

1                   Let me just work off this for one  
2 second. We'll see if these are relevant to what we  
3 were just talking about or not.

4                   First of all, just for the record, tell  
5 us if the handwriting on several of those exhibits  
6 is yours.

7           A.       Exhibit 213 is my handwriting.

8           Q.       Okay.

9           A.       Exhibit 215 is my handwriting.

10          Q.       Okay.

11          A.       216 appears to be my handwriting.

12          Q.       Okay.

13          A.       Gentry Exhibit 40 is not my  
14 handwriting.

15          Q.       Okay. All right. Let me mark one  
16 other exhibit while we're at it. This would be  
17 218, I think.

18                               (Nestor Exhibit No. 218 was  
19                               marked for identification.)

20                   BY MR. McMILLAN:

21          Q.       Mr. Nestor, showing you what's been  
22 marked as Exhibit 218, is that your handwriting?

23          A.       No. No, it is not.

24          Q.       Tell me whether any of the documents  
25 that I've just shown you starting with Exhibit 213

1 and continuing through the one you're holding  
2 there, 218, relate to the work that you did in  
3 1999.

4 A. 213 is.

5 Q. Okay.

6 A. 214 is. 215 is. 216 is not.

7 Q. Okay. Just give me that back then.

8 A. Gentry Exhibit 40 is.

9 Q. Okay.

10 A. 217 is.

11 MS. VITELLARO: Do you have another  
12 copy of 218?

13 MR. McMILLAN: I do. Let me just find  
14 my original here.

15 THE WITNESS: 218 is.

16 BY MR. McMILLAN:

17 Q. Okay. Was part of the work that you  
18 were doing here an effort to determine the relative  
19 impact of NOX versus microbial activity?

20 A. No.

21 Q. On the first page of Exhibit 218 -- on  
22 the first page of Exhibit 218, Mr. Nestor, in the  
23 third bullet there, it says -- or the third line,  
24 it says, "Isolate chemical versus microbial."

25 Do you know what reference -- what

1     that's a reference to?

2             A.     I did not write that.   So I'm not  
3     exactly sure.

4             Q.     Okay.  Did any of your work deal with  
5     that topic?

6             A.     I didn't do anything associated with  
7     microbial.

8             Q.     Do you know whether anyone at Reynolds  
9     has?

10            A.     I don't know.

11            Q.     Just sticking with 218 since you have  
12     that in front of you, it says right below where we  
13     were looking, "Relevance of above to real world  
14     concentrations," and then you go down and there's  
15     some numbers above a double line.

16                   And then right below that it says,  
17     "Need to further reduce to levels above double  
18     line."

19            A.     I see that.

20            Q.     Do you know what that's a reference to?

21            A.     What what is in reference to?

22            Q.     What I just read starting with  
23     "relevance of above to real world concentrations"  
24     and then everything that follows.

25            A.     Yes.

1 Q. Can you explain that to us?

2 A. Well, basically the work that was  
3 started with the pads was done based off of the  
4 experiment that was cited earlier as far as the NOX  
5 were into the barns.

6 And the one to four pounds that is  
7 listed here in the document correlates to the two  
8 levels that were utilized in that experiment in the  
9 barns.

10 Q. The one to four pounds listed here  
11 correlates to the .45 and the 1.8?

12 A. KGs.

13 Q. KGs?

14 A. Those are equivalents. And then the  
15 translation below that is translated to weights of  
16 tobacco that are listed, .120 to .480.

17 Q. What is it? Micrograms, is that what  
18 that is?

19 What does "mg" stand for?

20 A. I'm not sure if that's micrograms or  
21 milligrams.

22 Q. Okay. And do you know why a conclusion  
23 is reached here that says, "Need to further reduce  
24 to levels above double line"?

25 A. Yes.

1 asked me that question, I forgot what I was looking  
2 for.

3 Q. You were looking for the results, if  
4 they're reflected anywhere in any of these  
5 documents, of this effort you just described of  
6 further reducing the levels to levels that more  
7 closely simulated barns.

8 A. Yes, I do.

9 Q. Okay. What are you referring to?

10 A. The second page of document 218.

11 Q. Okay. Tell us what's shown there.  
12 Explain that to us, please.

13 A. In the area that starts with "NOX per  
14 WT air concentration," underneath that you have  
15 different amounts, one microliter, five microliters  
16 down to 50 microliters of NOX.

17 Q. So that's what was done.

18 Is there any results shown anywhere?  
19 Can you find the results?

20 A. You asked me if there was a reference  
21 to it, and that is a reference to it.

22 Q. Right. Can you find in any of the  
23 other documents the results of that experiment?

24 A. You'll have to give me a moment.

25 Q. Yep.

1           A.     I can't find any.

2           Q.     Were you the first person to do any lab

3     tests on NOX?

4           A.     No.

5           Q.     Who was the first person?

6           A.     I don't know who would have been the

7     first person.

8           Q.     Who else has done lab NOX work in any

9     significant amount other than you?

10          A.     Probably Dr. Peele, Dr. Gentry,

11     Mr. Riddick, myself would have all been involved in

12     some form or fashion at various times.

13          Q.     Was there some NOX lab work done in

14     1998?

15          A.     I don't know for certain.

16          Q.     When was -- what's your recollection of

17     the first time NOX lab work was done?

18          A.     Well, the experiments were run in '98

19     on the data that we discussed earlier.

20          Q.     What data did we discuss earlier?

21          A.     From the figure 2.

22          Q.     Oh, right.

23          A.     So that would be my first.

24          Q.     Okay. So that was done.

25                 Any other work that you were aware of

1 that was done prior to the time you started doing  
2 NOX lab work?

3 A. Well, along that same time frame as  
4 figure 2, I guess lab work would have been when  
5 Dr. Peele, I believe, exposed some tobaccos to NOX  
6 in the lab just to check that.

7 Q. Okay. Was the work you were doing in  
8 '99 in part directed to doing that lab work more  
9 thoroughly?

10 A. No.

11 Q. What conclusions did you reach from  
12 your work?

13 A. That NOX, when present with a tobacco  
14 alkaloid, has the ability to form nitrosamines.

15 Q. "Has the ability to form," what do you  
16 mean by that?

17 A. That it has the ability to nitrosate  
18 the alkaloid and form a nitrosamine.

19 Q. Okay. Did you make any effort to  
20 determine the nature or speed or any other  
21 characteristics of that activity?

22 A. I don't understand what you mean by  
23 "the nature."

24 Q. Did you make any effort to quantify  
25 that chemical reaction or what factors affected it?



1           A.     We attempted to quantify to the best of  
2     our ability the amounts of nitrosamines that were  
3     formed.

4                     And in some cases we were able to do so  
5     quite successfully, and others due to problems with  
6     just the experimentation nature of itself we were  
7     not.

8           Q.     Okay. Describe the places where you  
9     were not able.

10          A.     For instance, if we had a leak in a  
11     bag, then --

12          Q.     Well, I don't mean an equipment  
13     breakdown.

14                     Were there any experiments that you  
15     tried to carry out and did, in fact, carry out but  
16     weren't able to reach any conclusive results?

17          A.     No. If we were able to carry out the  
18     experiment and run an analysis, then the data would  
19     speak for itself.

20          Q.     Okay. Can you tell us where is the  
21     data that you collected as a result of your work?

22                     In which of these documents would you  
23     find that data?

24          A.     I see data associated with this work in  
25     Exhibit Gentry 40.

1 Q. Okay.

2 A. And Exhibit 217.

3 Q. All right. Tell us what part of  
4 exhibit -- or Gentry 40 summarizes work that you  
5 did.

6 A. What do you mean by "summarizes"?

7 Q. Reflects.

8 A. Okay. All of Gentry 40.

9 Q. Okay. Let's go to the second page,  
10 sample one.

11 What did you do with example one, and  
12 what results did you get?

13 A. In sample one, a pad was treated with  
14 150 milligrams of a nicotine solution and placed  
15 into a bag and then without anything added to it  
16 other than air --

17 Q. Okay. What --

18 A. -- and analyzed.

19 Q. And the next one is sample six.

20 What happened in sample six?

21 A. The "ISO" stands for the isopropyl  
22 alcohol in which the nicotine solution was -- and  
23 that was the solvent for the nicotine solution.

24 So the isopropyl alcohol alone without  
25 the presence of a nicotine was treated on a pad and

1 exposed to 315 microliters of NOX for one hour and  
2 analyzed.

3 Q. Now, in the rest of these samples on  
4 this page, is it true that in each case there was  
5 150 milligrams of the nicotine solution that was  
6 used and then something was added to it?

7 A. It appears.

8 Q. And the different -- what was added was  
9 different concentrations of NOX -- or excuse me --  
10 different amounts of NOX?

11 A. In some cases different amounts of NOX,  
12 right.

13 Q. Tell me what happened in sample 8.

14 A. Sample 8, it appears that a pad was  
15 treated with 150 milligrams of nicotine solution,  
16 exposed to 100 microliters of NOX for 30 minutes.

17 Q. And what happened?

18 A. For the extraction method that was  
19 utilized in that particular sample, we did not  
20 measure -- we didn't measure any nitrosamines.

21 Q. Okay. What happened in sample two?

22 A. Sample two, it appears that a pad was  
23 treated with 150 milligrams of nicotine solution,  
24 100 microliters of NOX was added into the bag for a  
25 ten-hour duration, extracted, and analyzed.

1 Q. Were any TSNAs detected?

2 A. In that particular sample, no.

3 Q. How do you explain that?

4 A. Again, you're asking me about a sample  
5 number two in which there were a number of samples  
6 that were ran early in this experiment to better  
7 understand how we should even extract, how we  
8 should treat these pads, how we should expose these  
9 pads.

10 It's difficult for me to be able to say  
11 that the method of exposure was the same for sample  
12 number two as sample number eight. As you can see,  
13 they're separated by a dark line, which would  
14 indicate to me that that was a separate experiment.

15 Q. Okay. Well, in any case, as you look  
16 at this data, there are some circumstances in which  
17 you add NOX to your nicotine solutions and get  
18 TSNAs and other circumstances where you add NOX to  
19 your nicotine solution and don't get TSNAs,  
20 correct?

21 A. Say that again.

22 Q. Your data reflects that in some cases  
23 you add NOX to the nicotine solution and get TSNAs  
24 and in other cases you add NOX to nicotine  
25 solution and don't get any TSNAs that you're able

1 to measure?

2 A. On these pads, that's correct.

3 Q. Well, were you able to determine why it  
4 was that sometimes you got a TSNA result and  
5 sometimes you didn't?

6 A. We had a lot of issues with the  
7 experimentation. Nicotine can be -- is very  
8 volatile. And so that may be part of the problem.

9 Like I say, early in the  
10 experimentation we had to try to understand how we  
11 would even expose these pads to NOX gas.

12 So there were several iterations in  
13 exactly how that occurred and also how long of an  
14 extraction period we would use to analyze these  
15 pads.

16 Q. Is it fair to say, Mr. Nestor, that  
17 when you first started out you had a number of  
18 situations where you weren't getting any TSNA's so  
19 you changed your experiment some?

20 A. It's fair to say that we evaluated  
21 different approaches to how we should do the  
22 experiment.

23 Q. And after you evaluated your various  
24 options, you selected one that resulted in TSNA's?

25 A. We selected one that gave us repeatable

1 results in a very scientific fashion.

2 Q. Right. And were you ever able to  
3 isolate or identify the reasons why sometimes you  
4 got no TSNAs when you added NOX to a nicotine  
5 solution?

6 A. Again, working with these tobacco  
7 alkaloids in a nontobacco matrix is very difficult  
8 because of their volatility, and the ability to  
9 keep them where you want them can be difficult.

10 Q. Was there a report or a compilation of  
11 the results that you put together?

12 A. No, I did not.

13 Q. Why not?

14 A. Again, we ran -- we had a lot of  
15 difficulty in terms of repeatability. We did the  
16 best that we could.

17 And because it's a nontobacco matrix,  
18 we did compile the data to the point of writing  
19 something up to share with the Swedish Match, but  
20 outside of that we did not do anything else.

21 Q. So there's a particular document that  
22 you authored that went to Swedish Match?

23 A. There was a presentation that was  
24 provided to them.

25 Q. A presentation.

1                   Before we break for lunch, let me just  
2 ask you a few general questions, Mr. Nestor.

3                   In 1999 when you were involved in  
4 initiating the NOX work, you were involved in the  
5 pilot program with the five farmers?

6           A.       Correct.

7           Q.       Exactly what was your role there?

8           A.       Again, my role was to coordinate the  
9 delivery of tobaccos from the farms so that full  
10 tobacco and smoke chemistry analyses could be  
11 conducted on those tobaccos.

12          Q.       Did you have any role in changing the  
13 equipment or altering the design of any of the  
14 equipment or altering any of the curing procedures  
15 that were used during the course of that pilot  
16 program?

17                   MS. VITELLARO: Objection, foundation.

18                   THE WITNESS: To my knowledge, no  
19 changes were made. I was not involved in any  
20 decisions regarding the insulation of heat  
21 exchangers.

22                   BY MR. McMILLAN:

23          Q.       You're not aware that fans were changed  
24 and fan configurations were changed and fan blades  
25 were changed?

1           A.     I was not involved with that.

2                     MS. VITELLARO:  Objection to  
3 foundation.

4                     BY MR. McMILLAN:

5           Q.     Have you ever been involved in any  
6 analysis of heat exchange or design?

7           A.     What do you mean?

8           Q.     Any aspect of heat exchange or design.  
9 I'm just trying to understand what kind of subjects  
10 I should be asking you questions about this  
11 afternoon.

12          A.     I have been provided samples, tobacco  
13 samples from flue-cured barns that have varying  
14 heat exchangers in them, and I've analyzed those  
15 tobaccos.

16          Q.     When you say you have analyzed those  
17 tobaccos, what do you mean?

18          A.     I've submitted them to the lab to be  
19 analyzed.

20          Q.     Just turn to the two graphs that are in  
21 Exhibit 40, the one that looks like this.

22                     The first graph, page number 6384, what  
23 does that show?

24          A.     The one that's titled "Time versus  
25 TSNAs"?



1 Q. Yes.

2 A. It appears to be a graph of TSNA levels  
3 versus a time axis.

4 Q. Is there any underlying data that this  
5 is graphed from; do you know?

6 A. I'm sure there is, but I don't know  
7 exactly where it would be.

8 Q. Is this at some particular  
9 concentration?

10 A. I would have to see the data.

11 Q. Okay. How about the next graph, NOX  
12 versus TSNA -- did you put together this graph, by  
13 the way?

14 A. I don't know.

15 Q. Do you know what's depicted here?

16 A. NOX versus TSNA's.

17 Q. So -- and this is NOX in what, pounds  
18 or . . .

19 A. I can't tell from this the -- the axis  
20 identifier is covered up.

21 Q. Okay. Well, what's the environment  
22 that this graph is applicable to?

23 A. Again, I'd have to see the data to  
24 know.

25 Q. You're unable to tell me just from this

1 graph what -- what someone was trying to show here?

2 A. I would have to see the data to see the  
3 parameters involved.

4 Q. Okay. Well, is the data part of this  
5 exhibit?

6 A. You'll have to give me some time to  
7 look. I can't say for certain that it is.

8 Q. Turn to the last four pages of the  
9 exhibit starting with Bates number 6387, please.

10 First of all, there appears to be some  
11 sort of summary at the beginning.

12 What is that reflecting?

13 A. What exactly are you referring to?

14 Q. It says, "Standards," and it says "NNN,  
15 NAT, NAV, and NNK," and then there's some average  
16 below that.

17 It says, "Standards," and it says,  
18 "NNN, NAT/NAB, NNK, and then there's some averages  
19 and then there's a total -- well, there's a TSNA  
20 line.

21 What's reflected there?

22 A. As indicated, we have a standard that  
23 is run, and that one, two, three, four would  
24 represent the five replications of the standard  
25 being run throughout a series of experiments.

1                   And that's your relative comparison  
2 point in order to interpretate (sic) the  
3 chromatographs and the areas that are provided in  
4 this data set.

5           Q.     What does the TSNA line mean?

6           A.     The TSNA milligrams per liter line?

7           Q.     Yes.

8           A.     That level, for instance, in the NNN  
9 column, 3.03 TSNA content, would correspond to a  
10 peak area of the 3595031.

11          Q.     Now, on the right-hand column of this  
12 page, there is something entitled NNK NNN, and  
13 there's some values listed there for at least some  
14 of these.

15                   What do those values mean?

16          A.     That appears to be the NNK to NNN  
17 ratio.

18          Q.     Why were you measuring the NN -- well,  
19 let me stop there.

20                   It's the ratio of NNK to NNN?

21          A.     Correct.

22          Q.     So if the ratio was 1.34, that means  
23 there's 1.34 times more NNK than there is NNN?

24          A.     Correct.

25          Q.     Why were you looking at the NNK to NNN

1 ratio?

2 A. Based off of historical data in  
3 direct-fired barns, we knew that flue-cured's  
4 predominant nitrosamine was NNK.

5 And we also knew from data that there's  
6 approximately a ratio between NNK and NNN.

7 Q. And what approximately is that ratio?

8 A. It's approximately 1.5, but it can vary  
9 depending upon the tobacco sample.

10 Q. So historically in flue-cured barns,  
11 you were finding that the NNK to NNN ratio was 1.5  
12 approximately?

13 A. Or higher.

14 Q. 1.5 or higher. What was the range?

15 A. I don't know off the top of my head.

16 Q. Approximately.

17 A. Again, it could vary by tobacco sample.

18 Q. What was the range?

19 A. It's safe to say that the NNK level was  
20 consistently higher than the NNN level, but how  
21 much higher, it can vary by tobacco sample.

22 Q. What about in barns equipped with heat  
23 exchangers, what is the characteristic ratio of NNK  
24 to NNN?

25 A. Both are significantly reduced down to

1 levels that are almost equivalent.

2 Q. Do you have a ratio?

3 A. It's approximately one to one.

4 Q. Approximately one to one, okay.

5 Why were you calculating the NNK to NNN  
6 ratio in your experiments in 1999?

7 A. Again, as a tieback to what happens in  
8 a flue-cured barn, if at all possible, to generate  
9 information pertaining to NNK versus NNN ratios and  
10 whether or not leading into what we see in  
11 flue-cured tobacco.

12 MR. McMILLAN: Why don't we break for  
13 lunch?

14 THE WITNESS: Sure.

15 THE VIDEOGRAPHER: Off the record at  
16 12:27.

17 (Recess.)

18 THE VIDEOGRAPHER: Back on the record  
19 at 1:10. Please proceed.

20 BY MR. McMILLAN:

21 Q. Mr. Nestor, before we broke we were  
22 talking about some of the NOX work that you did in  
23 the summer of 1999 prior to the time your article  
24 was published in September of '99.

25 Let me go back to that subject. First

1 of all, would it be accurate to say that the NOX  
2 work that you did in the summer of '99 had  
3 inconclusive results?

4 A. No, I don't think that would be a fair  
5 assessment.

6 Q. Do you know whether any of the results  
7 or conclusions or work that you did in 1999 on the  
8 NOX issue made its way into your paper?

9 A. No, they did not.

10 Q. Do you know why it didn't, why they  
11 didn't?

12 A. Because the work that you're referring  
13 to that I did in 1999 was, again, outside the  
14 tobacco matrix, and the paper is referencing the  
15 tobacco.

16 Q. I see. So there wasn't anything about  
17 the work you did in 1999 that you found supportive?

18 A. Again, if I had to summarize the  
19 results of my experiments with the NOX and the  
20 alkaloids, it would be that we did show an  
21 interaction between tobacco alkaloids and NOX in  
22 its role in forming tobacco-specific nitrosamines.

23 Q. But you were unable to show an  
24 interaction that had very much similarity to the  
25 interaction you see in the actual commercial

1 tobacco farm world; would that be right?

2 MS. VITELLARO: Objection, foundation.

3 THE WITNESS: It would be safe to say  
4 that we had difficulties in even conducting  
5 experiments based on the equipment that we had  
6 available at extremely low concentrations.

7 BY MR. McMILLAN:

8 Q. Okay. In other words, you weren't able  
9 to prove out the hypothesis at extremely low  
10 concentrations?

11 A. We were unable to conduct the  
12 experiments.

13 Q. All right. Let me go through -- let me  
14 just see if you recognize this, and then we'll mark  
15 it.

16 Has that got anything to do with the  
17 Swedish Match or presentation that you referred to  
18 earlier?

19 A. Yes.

20 MR. McMILLAN: Okay. Well, let's mark  
21 that, and I'll substitute the yellow highlighted  
22 copy.

23 Can you mark that 219?

24 (Nestor Exhibit No. 219 was  
25 marked for identification.)

1 BY MR. McMILLAN:

2 Q. All right. We've marked as Exhibit 219  
3 something entitled, "Formation of tobacco specific  
4 nitrosamines by reacting tobacco alkaloids with  
5 nitric oxide NOX."

6 What is that document?

7 A. This document was prepared and provided  
8 to Swedish Match.

9 Q. Were any conclusions or other documents  
10 provided to Swedish Match?

11 A. Again, we had shared with them the  
12 presentation, the results that we had obtained.

13 Q. Was that in writing?

14 A. What do you mean?

15 Q. Well, the thing you're holding in front  
16 of you is in writing. I'm asking whether anything  
17 else in writing was provided to Swedish Match.

18 A. Were there hard copies of a  
19 presentation provided?

20 Q. Yes.

21 A. Yes.

22 Q. Could you go back to the exhibit that  
23 is entitled "Outline for TSNA"?

24 The outline for TSNA presentation in is  
25 exhibit -- what's the exhibit number, Mr. Nestor?



1 A. 213.

2 Q. 213. Who prepared this?

3 A. I can't say for sure.

4 Q. Who do you think prepared it?

5 A. I'd have to speculate.

6 Q. Was it probably you?

7 A. It's a possibility.

8 Q. Do you know what this document is  
9 relating to?

10 A. I believe it's relating to the  
11 presentation that was provided to Swedish Match.

12 Q. Roman numeral three starts out by  
13 saying, quote, "Realizing that full NOX exposure  
14 was not relevant."

15 Do you know what that meant?

16 A. Meaning just exposing pads to a hundred  
17 percent concentration of NOX gas.

18 Q. Why was that not relevant?

19 A. It wasn't real world.

20 Q. Okay. Are these your handwritten  
21 notes?

22 A. These are my handwritten notes.

23 Q. Okay. Is this -- are these handwritten  
24 notes an effort to summarize in your own  
25 handwriting what the Roman numerals refer to?

1           A.     The handwriting at the bottom is an  
2     effort to basically begin to lay out the  
3     presentation.

4           Q.     Okay. Number four in your handwriting  
5     says, "Chart."

6                     What does that say?

7           A.     "Chart of NOX dosage."

8           Q.     And then what?

9           A.     "With table."

10          Q.     "With table"?

11          A.     What it appears to say, yes.

12          Q.     Who made the presentation to Swedish  
13     Match?

14          A.     I did.

15          Q.     Anyone else?

16          A.     Did anyone --

17          Q.     Did anyone else attend?

18          A.     Attend, yes.

19          Q.     Who?

20          A.     I don't know everyone that attended,  
21     but Dr. Gentry would have attended and Dr. Peele  
22     and Mr. Riddick.

23          Q.     Who attended from Swedish Match?

24          A.     Inger Wahlberg would have been there  
25     and some of her associates, and I don't remember

1 experiments of their own which emulated this, and  
2 that was the last collaboration that I've had with  
3 them.

4 Q. And did they carry through a set of  
5 experiments of their own?

6 A. I know that some were initiated, and  
7 I'm trying -- I don't remember if they were  
8 completed.

9 Q. Do you remember whether Swedish Match  
10 ever made a presentation to you?

11 A. There was not a presentation made back.

12 Q. Were any conclusions of the results of  
13 their work communicated back to you?

14 A. Again, there was correspondence, but I  
15 don't recall exactly what that correspondence was.

16 Q. Were their results inconclusive?

17 MS. VITELLARO: Objection, foundation.

18 THE WITNESS: Again, I don't remember  
19 what the correspondence contained.

20 BY MR. McMILLAN:

21 Q. Who was the correspondence with; do you  
22 remember?

23 A. It was a gentleman that had been  
24 contracted through Swedish Match.

25 Q. What was his name?

1           A.     I couldn't begin to pronounce it. I  
2 really don't --

3           Q.     It's a Swedish name?

4           A.     It's not American.

5           Q.     But where was he; do you know? Where  
6 did he work?

7           A.     I assume he operated out of the Swedish  
8 Match facility, but I don't know.

9           Q.     Showing you what's been marked as  
10 Gentry Deposition Exhibit No. 64, would that happen  
11 to be the Swedish Match presentation?

12          A.     Yes.

13          Q.     Now, there's a page here that says,  
14 "NOX dosage study," and unfortunately the copy we  
15 have is pretty hard to read.

16                 Do you happen to know what I'd see if I  
17 looked in the left hand -- well, the left-hand  
18 column is a list of TSNAs, right?

19          A.     And NNN, NAT, NAB and NNK.

20          Q.     Right. And then the next column over,  
21 what was that?

22                 MR. McMILLAN: Is there a way we can  
23 get a better copy of this?

24                 MS. VITELLARO: I'll take it under  
25 advisement and see if we can.

1 BY MR. McMILLAN:

2 Q. Mr. Nestor, I'm showing you what's been  
3 marked as Nestor Deposition Exhibit 221.

4 Are these your notes?

5 A. They appear to be.

6 Q. The first line says, "Avoca and Swedish  
7 Match."

8 What does that mean?

9 A. This was a meeting of Swedish Match  
10 with R.J.R. personnel as we had talked about  
11 earlier as part of our collaborative work in  
12 understanding nitrosamine formation.

13 Q. Was this the same meeting where you  
14 made the presentation to them?

15 A. I'd have to go back and look at the  
16 date on the presentation to be able to say, but I  
17 don't believe so.

18 Q. It was July of '99.

19 A. These notes were dated March 7th of  
20 2000, so . . .

21 Q. Is this some presentation by Swedish  
22 Match back to you?

23 A. These were my notes from the meeting.  
24 Whether it's just general discussion or a  
25 presentation, I don't know.

1 Q. About two-thirds of the way down, it  
2 says, "Water activity, amount of water available to  
3 bacteria in order for them to grow. Below .89  
4 bacteria will not grow."

5 What does that mean?

6 A. Again, I was just taking notes. I'm  
7 not a microbiologist. I couldn't begin to really  
8 translate what that means.

9 Q. Do you know who made that statement?

10 A. Probably someone from Swedish Match.

11 Q. And you have no understanding of what  
12 it means?

13 A. Again, I'm not a microbiologist.

14 Q. I know. But you said earlier you were  
15 a scientist. So I was going to take whatever  
16 understanding you have.

17 A. I'm a scientist, and I'm very familiar  
18 with tobacco-related science. This is  
19 bacteria-related science that I am not familiar  
20 with.

21 Q. I see. Okay.

22 Do you remember who was present at this  
23 meeting?

24 A. Probably the same individuals that I  
25 referred to earlier.

1 (Nestor Exhibit No. 222 was  
2 marked for identification.)

3 BY MR. McMILLAN:

4 Q. I'm showing you what's been marked  
5 Nestor Exhibit No. 222.

6 That's a copy of an E-mail from Jeff  
7 Mallard to you dated June 4th, 2001, and the  
8 subject is "2001 flue-cured TSNA program two."

9 Then it says, quote, "Please find the  
10 listed names of R.J. RT contracted growers to be  
11 those selected in program two of the 2001 crop  
12 flue-cured TSNA program."

13 What's that in reference to?

14 A. I don't remember.

15 Q. Were you the overall coordinator of the  
16 2001 TSNA program?

17 A. Oh, okay. You're talking about 2001.  
18 Program two, we had had a set of objectives, and  
19 that must be referring to one of those objectives  
20 in terms of program two.

21 Q. What were the set of objectives?

22 A. I would have to see the objective sheet  
23 to be able to speak to that.

24 MR. McMILLAN: Can we mark that,  
25 please?

1 Q. Okay. Several different objectives you  
2 mean?

3 A. Several research programs that were  
4 within what we were going to do in 2001.

5 Q. Do you remember any of those research  
6 programs?

7 A. Yes, I do.

8 Q. Okay. What ones do you remember?

9 A. One was we looked at carry-over  
10 tobacco, tobacco that had been cured in the year  
11 2000 and had been carried over into the year 2001.

12 One program looked at tobaccos that had  
13 been cured in nonVencon Varsos heat exchange units.  
14 One was a tobacco tracking experiment in which we  
15 tracked tobacco from the barn through various  
16 stations, as you will, until the tobacco finally  
17 got to our inventory being the final point.

18 And then the last thing would have  
19 dealt with our standard inventory monitoring.

20 Q. What conclusions did you reach on that  
21 third project?

22 A. The tracking?

23 Q. The tracking project.

24 A. In the tracking experiment, we did not  
25 see any accumulation issues associated with



1 flue-cured tobacco at the sample points that we  
2 chose post curing.

3 Q. In other words, if TSNAs were low at  
4 the end of the cure, they stayed low?

5 A. If TSNAs were low and put up properly,  
6 they stayed low.

7 Q. What do you mean by "put up properly"?

8 A. Put up with proper moistures.

9 Q. What do you mean by "put up with proper  
10 moistures"?

11 A. If they weren't put up too wet, then  
12 there was no issues in terms of nitrosamine  
13 accumulation.

14 Q. I'm sorry, but I don't understand what  
15 the words "put up" mean.

16 A. As in baled. Once it's out of the  
17 barn. I apologize.

18 Q. Okay. So you found that if they were  
19 baled correctly without too much moistures, the  
20 TSNAs stayed low?

21 A. Correct.

22 Q. And if they were baled with too much  
23 moisture, what happened?

24 A. Then the ability for nitrosamine  
25 formation to occur was there, and in some cases we

1           A.     I don't know what "right-hand man" is,  
2     but I reported to Dr. Gentry for some time.

3           Q.     Were you the guy he turned to for sort  
4     of special projects?

5           A.     I had a variety of projects under  
6     Dr. Gentry.

7                                 (Nestor Exhibit Nos. 228-229  
8                                 were marked for identification.)

9                                 BY MR. McMILLAN:

10          Q.     Let me show you what's been marked  
11     Exhibit 228. The first page of this document is on  
12     the letterhead of Sanders Company, Inc.

13                                 Do you know who that is?

14          A.     No.

15          Q.     The next page is entitled "Avoca  
16     nitrosamine experiments." And number one is  
17     talking about Star tobacco.

18                                 Were you involved in any of that work?

19          A.     Yes.

20          Q.     What was the purpose of that work?

21          A.     I believe this was a repeat of what  
22     Dr. Peele had done previously.

23          Q.     What was the purpose of what you and  
24     Dr. Peele did?

25          A.     Well, a repeat in terms of exposing

1     tobaccos to NOX gas. In this case we had a Star  
2     tobacco sample as well.

3             Q.     And what was the purpose of exposing  
4     Star tobacco to NOX gas?

5             A.     Just see if it behaved any differently  
6     than what we had experienced with other flue-cured  
7     tobaccos.

8             Q.     But this was Star tobacco that had  
9     already been cured?

10            A.     That's correct.

11            Q.     Why were you exposing it to NOX after  
12     it had been cured?

13            A.     That's, again, what Dr. Peele had done  
14     initially as well.

15            Q.     Why? What's the reason for doing that?

16            A.     Just to see if the exposure to NOX gas  
17     would in any way change the nitrosamine level as it  
18     had been seen previously.

19            Q.     Was there any result of that?

20            A.     I'm sure there was.

21            Q.     Do you know what it was?

22            A.     I don't recall what it was.

23            Q.     The next exhibit is 229. Is that your  
24     notes also?

25            A.     It appears to be.

1 Q. It begins by saying, "Star tobacco 30  
2 to 50 pounds of flue-cured strip."

3 Did there come a time when you or  
4 somebody that you were working for made a request  
5 to somebody for 30 to 50 pounds of Star tobacco?

6 A. No, I don't believe that was a request  
7 on our behalf. I think as it reads as a question  
8 is that I may have been told that there was some  
9 amount of flue-cured tobacco from Star that we had  
10 been given.

11 Q. And was that about 30 to 50 pounds?

12 A. As it turned out, I don't know that it  
13 was -- it may have been on the order of 30 or less,  
14 but I don't believe it was 50.

15 Q. And do you know where that 30 pounds  
16 came from?

17 A. No.

18 Q. When was that provided to you?

19 A. I don't know for sure.

20 Q. The latter part of 1998?

21 A. I don't know for sure.

22 Q. Do you know what you did with the  
23 30 pounds?

24 A. Yes.

25 Q. What?

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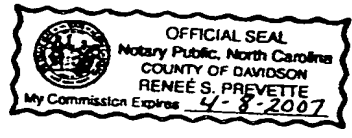
Tracy B. [Signature]

SIGNATURE OF THE WITNESS

SUBSCRIBED AND SWORN to before me this 10<sup>th</sup>  
day of, October 2002.

Renée S. Prevette

NOTARY PUBLIC



My Commission expires: April 8, 2007

ALDERSON REPORTING COMPANY, INC.  
1111 FOURTEENTH STREET, N.W., SUITE 400  
WASHINGTON, D.C. 20005  
(202) 289-2260

ERRATA SHEET FOR THE TRANSCRIPT OF:

Notice Date: September 17, 2002

**Case Name: Star Scientific, Inc. vs. R. J. Reynolds Tobacco Co.**

Case Number: AW 01-CV-1504

Dep. Date: August 29, 2002

**Deponent: Tim Nestor**

Place: Chicago IL

Ref. No.: 4706-2

**CORRECTIONS:**

[illegible]

Tried 3 more

Signature of Deponent

10/09/02

A method for modifying a tobacco curing barn provided with a direct fire heating unit for the purpose of providing conditions suitable for curing tobacco such that resulting cured tobacco obtained from said barn possesses a tobacco specific nitrosamine content lower than that obtained prior to such modification, the method comprising:

removing the direct fire heating unit from the tobacco barn,

providing the tobacco barn with a heating unit that does not generate exhaust gases comprising nitric oxides in a fashion that would cause contact between said nitric oxides and said tobacco within said barn, and further modifying said barn to permit correlation of the specific nitrosamine content of said cured tobacco with the actual level of nitric oxides to which said tobacco is exposed in said barn, wherein said barn as modified may be used for the curing of tobacco leaves.

MAR-19-2000 23:46

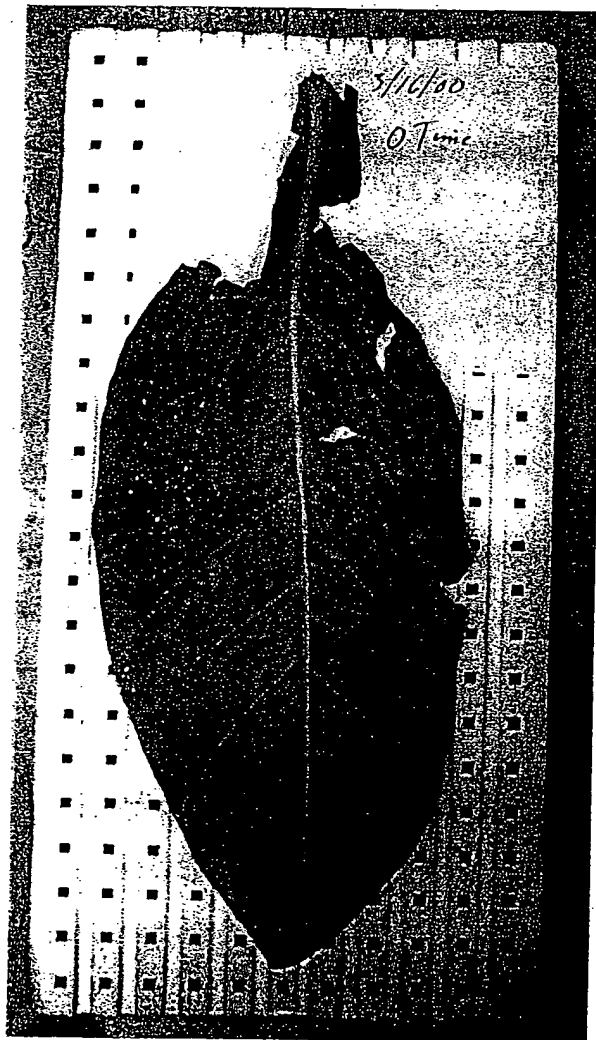
N212 AGRONOMY DEPT

P.02

Tobacco type	NNN	NAT/NAB	NNK	TOTAL	Nicotine mg/g	Total-N mg/g
Flue cured control	1.10	1.89	1.35	4.34	38.3	30.9
Flue cured at 21% moisture	1.28	1.99	1.48	4.76	38.5	30.3
Flue cured run #9	1.29	2.06	1.66	5.02	40.0	30.2
Flue cured run #10	1.30	1.97	1.60	4.87	41.1	29.1
Flue cured run #1	1.57	2.38	2.20	6.15	41.3	31.5
Flue cured run #3 (Stem burn)	1.32	2.03	1.67	5.03	41.7	31.6
Burley control dry	2.71	2.58	0.18	5.47	47.5	47.0
Burley at 17% moisture	3.17	3.07	0.20	6.44	48.6	47.6
Burley run # 11	2.89	2.62	0.15	5.66	45.9	47.3
Burley run #7	3.38	2.80	0.13	6.30	46.3	48.2
Burley run #6	3.24	2.82	0.21	6.26	47.8	47.5
Burley run #5	3.48	3.05	0.19	6.72	46.5	48.6
Burley run #4	2.96	2.68	0.15	5.79	48.3	47.9

TOTAL P.02





C

MAR-09-2000 14:35

2 AGRONOMY DEPT

P.02



BROWN & WILLIAMSON  
TOBACCO

RESEARCH & DEVELOPMENT

FAX TRANSMITTAL  
March 9, 2000

No. of Pages:	
To: Dr. Harold Burton	From: Pat Dearing
Company:	Telephone No.:
Panafax No.: 1-808-257-7125	Panafax No.: (912) 464-4014

Dear Doctor Burton:

Here is the information on the samples given to you by Mr. Williams.

The flue cured tobacco is grade B4F and the burley tobacco is grade B3F as graded by USDA.

Flue Cured

1 pound flue cured moisture at 12%

4 pounds flue cured moisture at 21.5%

The moisture was raised by applying steam.

Burley

1 pound burley moisture at 12%

4 pounds burley moisture at 18.99%

Moisture was reached by applying 4% sugar water.

If you have any other questions, please feel free to call me at 912-464-3517.

*Pat Dearing*  
Pat Dearing

RECEIVED  
MAR 29 2000  
TC 2100 MAIL ROOM

AUG-28-1998 17:36 FROM UK AGRONOMY DEPT

TO 912022937860 P.02

**FAX**

**University of Kentucky**

Department of Agronomy  
N-122 Agricultural Science Center North  
Lexington, Kentucky 40546-0091 U.S.A.

Date: \_\_\_\_\_

Number of pages  
(including cover sheet) \_\_\_\_\_

To: Ron Delmendo  
Sophia M. non 2min  
Mac park + Sean

From: H Bruts

Fax Phone: 202 293-7860  
Phone: \_\_\_\_\_

Fax Phone: (606) 257-7125  
Phone: 606 257-7901

**REMARKS:**

Ron:  
FYI

C

August 28, 1998

Ron Dehnendo  
Sughrus Mion Zinn Macpeak & Seas  
Washington DC 20037

Dear Ron:

Jonnie Williams wanted me to send you a brief statement on what occurs during flue curing of tobacco and would make this curing unique. I am not an expert in the flue cure tobacco, since it is not produced in Kentucky. Certainly I am more familiar with the air-curing process and know that I have qualified my expertise here goes the discussion.

Tobacco specific nitrosamines (TSNA) are formed primarily during the curing process. I have observed that TSNA in cured tobacco leaf are dependent on the accumulation of nitrite in the leaf during curing. I have been postulated that nitrite accumulates during curing by the reduction of nitrate. Nitrite accumulates during the death of the cell and experimental evidence indicates that it is formed by the micro flora on the surface of the leaf. It must be noted that for the micro flora to reduce nitrate to nitrite conditions should be approaching anaerobic (oxygen deficient) conditions. If conditions are aerobic, the microbes will use the oxygen in the atmosphere for their energy source. If the curing in a micro climate is aerobic then no nitrite will form. The curing process is certainly more complex than this explanation but it should give a thumbnail sketch on what is happening during curing.

I was in China for two weeks during 1997 and I was given commercial Chinese cigarettes. I brought some of them back to the US and decided to analyze them for TSNA. To my surprise I could not detect TSNA or when I did they were very low. We analyzed at least five different commercial cigarettes and the were the leading cigarettes in China. These cigarettes were made of only flue cured tobacco and are more like the cigarettes manufactured in England. China does not import any tobacco and therefore it was all grown in China. Since China is a developing country, they are still use the old curing technology that was abandoned in the US during the sixties. It seemed to me that the probable cause for the absence of TSNA was their use of the old flue-curing techniques. This technique uses burning fuel and passing the hot gases through flue pipes in the curing barn. Therefore, tobacco in the old barns were exposed to radiant heat. The modern curing barns are different since the fuel source (propane) is combusted and the exhaust is passed directly through the tobacco. This can create anaerobic condition since the oxygen in the atmosphere is depleted by combustion and the combustion gases (carbon dioxide and water) are not aerobic. During curing the tobacco leaf also emits carbon dioxide and will dilute the oxygen further.

On Monday, August 24, 1998, when I was visiting the Case City plant I noticed a furnace Star Tobacco had attached to its MicroDry drier. That is when I found out that most of the bulk curing units have furnaces which exhaust the combustion gases through the tobacco. This seemed like the process may contribute an atmosphere that could cause accumulation of nitrite and subsequently TSNA.

Hopefully this short discourse will aid you in the patent application. If you have any further questions please call me.

Sincerely,

  
Harold R. Furton

DEPOSITION  
EXHIBIT

53

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: )  
Jonnie R. WILLIAMS )  
Serial No.: 08/998,043 ) Group Art Unit: 1731  
Filed: December 23, 1997 ) Examiner: Ruller, J.  
For: TOBACCO PRODUCTS HAVING REDUCED ) Atty. Dkt. No.: 04859.84699  
NITROSAMINE CONTENT )

#29633103

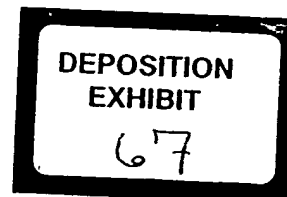
**DECLARATION OF HAROLD R. BURTON, Ph.D.**

Honorable Assistant Commissioner for Patents  
Washington, DC 20231

Sir:

I, Harold R. Burton, Ph.D., hereby declare as follows.

1. I am an Associate Professor of Agronomy at the University of Kentucky, College of Agriculture, in Lexington, Kentucky. I have been on the faculty of the College of Agriculture for 33 years. I have an extensive background in the areas of organo-analytical chemistry relating to agronomy, particularly in the fields of tobacco chemistry and science. I have published widely in this field.
2. I am a consultant for Star Scientific, Inc., the exclusive licensee of the above-captioned application.
3. I am familiar with the above-captioned application. I also have studied the Office Action dated February 23, 2000 (hereinafter "the Office Action").



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Heljo U.S. Patent 2,758,603

4. I have studied and am familiar with Heljo U.S. Patent 2,758,603 cited in the Office Action. The Heljo process is designed for use by the cigarette processor as a conditioning step just before cigarette manufacture. Note that Example II, which treats a mixture suitable for cigarettes, states that upon completion of the heating "... the tobacco is allowed to stand at room temperature for about 24 hours. It is then flavored and is ready to be made into cigarettes." Similarly Example III states "the tobacco is allowed to stand for about 24 hours at room temperature and it is then mixed with the other tobacco components, cut to size, flavored and made into cigarettes."

5. Heljo is not and does not purport to be a curing process. Indeed, given the short heating times and the fact that the tobacco is treated with steam to increase its moisture content to 18-25%, it is clear that the tobacco treated by the Heljo process is already fully cured as that term is conventionally used by tobacco growers. I am confident that the reference to curing is a reference to conditioning (or aging) and the reference to "uncured" is a reference to tobacco that has been cured but has not been fully aged. Heating cured tobacco to accelerate aging is employed in some countries.

6. Heljo describes applying radio frequency heating to tobacco. The electromagnetic energy has a frequency of 16 to 60 megacycles (MHZ) (column 2, lines 37-41). The tobacco is heated to 80°C to 120°C for a period of 1 to 3 minutes. Prior to the high frequency heating of Heljo, the dried (cured) tobacco contains significant levels of nitrosamines, including 4-(N-nitrosomethylamino)-1-(3-pyridyl)-1-butanone (NNK), which are formed predominately during conventional tobacco curing.

7. My own research and experience have shown that applying high frequency energy to already cured tobacco does not significantly promote decomposition of NNK and therefore does not

significantly reduce NNK content in the tobacco product. The TSNA content of cured tobacco is difficult to reduce once the nitrosamines are formed during curing. Therefore, it was clear to me that the process of Heljo would not be effective to significantly reduce the TSNA or NNK content of the tobacco.

8. I was present and personally observed the tests reported in the Hudson Declaration.

9. The tobacco samples were prepared by Brown and Williamson as shown in Attachment A. As Mr. Hudson states, the tobacco was heated in transparent Ziploc storage bags and in runs 9, 10 and 11 additional water was added to the bags to simulate the introduction of steam through aperture 19. I caused the untreated controls and the treated tobacco products of Test Runs Nos. 7, 9, 10 and 11 to be analyzed following freeze-drying of the products so that the results are on a comparable (dry) basis. The results were as follows:

	NNN ( $\mu$ g/g)	NAT/NAB ( $\mu$ g/g)	NNK ( $\mu$ g/g)	TSNA ( $\mu$ g/g)	Nicotine (mg/g)	Total N (mg/g)
Flue cured Control	1.10	1.89	1.35	4.34	38.3	30.9
Run #9	1.29	2.06	1.66	5.02	40.0	30.2
Run #10	1.30	1.97	1.60	4.87	41.1	29.1
Burley Control	2.71	2.58	0.18	5.47	47.5	47.0
Run #7	3.38	2.80	0.13	6.30	46.3	48.2
Run #11	2.89	2.62	0.15	5.66	45.9	47.3

The nitrosamine contents were measured using a commercial Nitrosamine Specific Detector manufactured by Thermedics. The nitrogen contents were measured by a conventional Kjeldhal procedure.

10. Upon completion of the heating the tobacco gave off a pungent odor as referred to by Heljo at col 4, lines 1-2. Nonetheless, the above results demonstrate the heating was not effective to reduce the tobacco-specific nitrosamine (TSNA) or NNK content. This was not unexpected.

11. The tests reported by Mr. Hudson are appropriate to demonstrate the results obtained by Heljo.

12. The above results together with similar analyses of earlier runs is attached as Attachment B. This is provided simply to complete the record. Note that none of the tests resulted in any significant reduction in NNK content.

Marley et al. U.S. Patent 4,790,335

13. I am also familiar with and have studied Marley et al. U.S. Patent 4,790,335 cited in the Office Action. The Marley patent describes an apparatus for curing tobacco which employs a gas tank (typically propane) for fueling dual heating systems which heat separate chambers (52, 54) for curing the leaves and stems, respectively. Combustion exhaust gases produced by burning propane (or other fuel source) in heater blowers 40 and 42 are circulated through the chambers during curing of the tobacco. Marley does not describe taking any steps to remove combustion exhaust gases from the chambers and, indeed, direct-fired heating was a conventional method of curing tobacco.

14. I note that the Marley patent reports "degrees" but does not state whether they are Fahrenheit or Centigrade. I am confident that one of ordinary skill in the art would understand that the degrees are, in fact, Fahrenheit. I say that for two reasons. First, the temperatures reported in the Marley patent closely parallel the temperatures (in °F) employed for conventional flue curing. Secondly, the conversion of chlorophyll is enzymatic and enzymes are generally inactivated at temperatures well below 105°C. See e.g. Dixon, Enzymes, p. 146, Academic Press, 1964. Inactivation of those enzymes deprive the plant of its ability to move beyond the initial green state. Nevertheless, to



confirm this, I also caused green tobacco to be heated at 105°C for 18 minutes. As expected, this treatment set in the green color and failed to yellow the tobacco, as shown in Attachment C.

15. I personally observed the tests reported in the Lamb Declaration and can state that the green tobacco which was subjected to heating was not unusually moist, nor was the humidity high at the time of the test. Once again, I was not surprised at the results. I expected that short heating regimen of the Marley patent would "set" the green color of the leaf and that is exactly what occurred as demonstrated by the photographs accompanying the Lamb Declaration.

16. Marley relies solely on direct-fired heating to obtain the desired temperatures. The use of direct-fired heating actually contributes to the formation of nitrosamines. Combustion products react with components in the tobacco leaf to form nitrosamines.

17. The tests reported by Mr. Lamb are appropriate to demonstrate the results obtained following the teaching of the Marley patent.

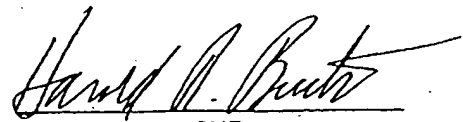
#### Other Matters

18. Comparing the content of NNK or other nitrosamine in a particular tobacco product to the corresponding content in a control, which was treated and cured in accordance with conventional techniques, is a standard used and understood in the art. A person skilled in the art would be able to ascertain by appropriate analysis the content of NNK or other nitrosamine in a given tobacco product in relation to the corresponding content in tobacco which was cured in accordance with conventional techniques.

19. I can confirm that the phrase 'normal nicotine content' of a tobacco variety is a phrase which is understood by one skilled in the art.

I hereby acknowledge that all statements made herein of my own knowledge are true and that all statements made herein on information and belief are believed to be true. I acknowledge that willful false statements and the like are punishable by fine or imprisonment, or both (18 U.S.C. § 1001), and may jeopardize the validity of the application or any patent issuing thereon.

Date: 3/27/00

  
Harold R. Burton, Ph.D.

C